IES-1248-51V

48-port ADSL2+ remote IP DSLAM with embedded Media Gateway

Support Notes

Version 3.53
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ZyXEL
Unleash Networking Power

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Application Notes

How to configure the Voice over IP (VoIP) features

The IES-1248-51V is an IP-based DSLAM that connects ADSL and voice subscribers to the Internet. It provides 48 aggregated lines of POTS connectivity, designed to connect the subscriber with the PSTN. Each telephone line interface is a FXS port connecting to the subscriber's telephone via copper wire. The analog voice signal from the subscriber is converted to voice data packets and transmitted towards the callee across the IP packet-switched network. The IES-1248-51V uses SIP for network signaling to establish or tear down a voice call. DTMF signals are also translated into SIP signals (or transmitted in the voice band).

What is VoIP

Traditional voice switching business has long been the mainstay for a relatively small group of global equipment suppliers. But times has changes, carriers are adopting a standardized IP Multimedia Subsystem architecture for next-generation networks with distributed softswitch call control and independent Media Gateways. In addition to the legacy circuit switch equipment suppliers, the equipment market reshuffles and opens to new vendors.

Media Gateway is a network element which packetize voice traffic from POTS signals to IP packets and perform critical voice network features such as echo cancellation, silence detection and suppression, etc. Softswitch is the one which provides call control to Media Gateways in a packet voice network.

Through IES-1248-51V, ZyXEL transforms its IP DSLAM portfolio into multi-service DSLAM and starts to enter the Media Gateway market worldwide.

VoIP is the sending of voice signals over the Internet Protocol. This allows you to make phone calls and send faxes over the Internet at a fraction of the cost of using the traditional circuit-switched telephone network.

What is SIP

The Session Initiation Protocol (SIP: RFC 3261) is an ASCII-based, peer-to-peer protocol designed to provide rendezvous services over the Internet. SIP is an Internet Engineering Task Force (IETF) specification that was derived from Hypertext Transfer

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Protocol (HTTP: RFC 2616) and Simple Mail Transfer Protocol (SMTP: RFC 821).

SIP, along with Media Gateway Control Protocol (MGCP: RFC 2705), and H.323 (an International Telecommunications Union (ITU) specification), is one of three commonly used open protocols for VoIP implementations.

SIP User Agent:

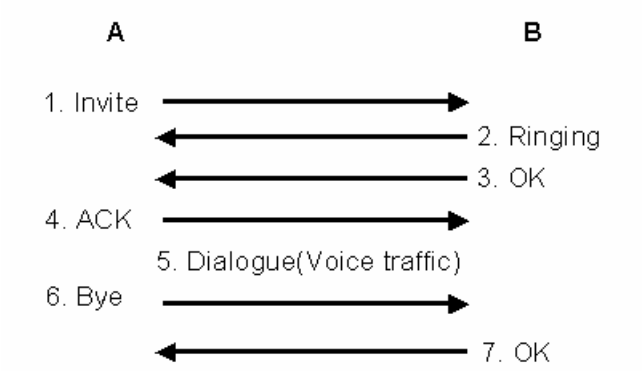
User Agents (UA's) are specified in RFC 3261 as applications such as SIP phones and software that initiate and receive calls over a SIP network.

SIP Server:

Servers are specified in RFC 3261 as application programs that accept requests, service requests and send back responses to those requests.

SIP Call Flow:

The following figure describe the SIP messages exchanged for call establishment and tear down.



Step	Description
1	Invite: User A initiates a call to user B. This message is an invitation for B to participate in a SIP telephone call.
2	Ringing: User B sends a response to user A and indicates that the phone is ringing.
3	OK: B sends a OK response after the call is answered.
4	ACK: User A then sends an ACK message to acknowledge that B has answered the call.
5	Voice: a two-way voice channel is established over real-time protocol (RTP) and a conversation takes place between user A and B.
6	Bye: User A hangs up.
7	OK: User B replied a OK message confirming receipt of the Bye request and the call is terminated.

For more information about SIP messages, please see RFC 3261.

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Parameters specially for VoIP service

The IES-1248-51V is different form other xDSL series pizza-box. Following table display some novel attributes in IES-1248-51V only. Operators should be careful with these parameters while deploying VoIP.

Item	Description
IP Address	A unique IP address for IES-1248-51V
DNS	Specify the IP address of the Domain Name System server for VoIP service. You do not need to enter this if your SIP server uses IP addresses in SIP messages (not domain names).
Default VoIP Gateway	Define the default outgoing gateway for VoIP service.
SIP profile	1. Setup the SIP IP / Domain Name of sip server, registrar IP and proxy server IP. The default port number is 5060 but can be customized in both SIP server and the IES-1248-51V. 2. “URI Type” can be “sip” or “tel”, it’s used in the signaling packet header and SIP server must recognize the URI format when read the packets. Otherwise the requests will be discarded if SIP server cannot support. Default “URI Type” is SIP. 3. “802.1p Priority” (0~7) and “DSCP” (Differentiated Service Code Point, 0~63) are used to define the QoS in VLAN tag and IP header respectively. 4. “Keep Alive” is defined in RFC4028 as a keep-alive mechanism for SIP sessions. UAs send periodic re-INVITE or UPDATE requests to keep the session alive. In “Session Expiration”, you can enter the minimum number of seconds after which the IES tears down the session (if no successful session refresh has occurred). 5. “Provisional Response ACK” is used to set whether the IES sends provisional acknowledgment messages (ON), or does not send them (OFF).
Call service profile	This setting allows operator to define the authentication password and what call features to be active/inactive. 1. “Name” is the name of this call service profile. If you select “ON” in the Password for SIP Registration field, the name is also used for user authentication.

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	2. “Password” is used in SIP authentication while registering. If the SIP account this profile uses does not require a password for user authentication, you do not need to configure it. 3. “Do not Disturb” rejects all incoming calls via automatically reply “486 Busy” message to caller. 4. “Call Hold” service allows user to accept another call on waiting or transfer to another remote party. Typically, user needs to press flash button to put remote party on hold or resume conversation. To enable “Call Wait” and “Call Transfer”, this feature must be active in advance. 5. “Call Wait” allows the indication of third-party incoming call. If turn on, the subscriber will be notified with call waiting tone that an incoming call is waiting, instead of replying “Busy” directly. When a call awaits, user should decide to (1)reject it, (2)accept it and terminate original conversation, (3)accept it and hold original dialogue. 6. “Call Transfer” is a mechanism to transfer current correspondent to another remote user. After transferring, the two parties can chat. 7. DTMF (digital tone multi frequency) Relay is voice band signal normally used to identify which dial button is pressed on the phone. Now IES-1248-51V supports four types of DTMF processing. User can configure to bypass DTMF signal as in-band voice, relay it as RFC2833/RFC2833 like (Cisco compatible) RTP packets, or relay it by SIP INFO messages. 8. Two types of FAX services – bypass FAX signal with G.711 CODEC or relay according to ITU-T T.38. User can configure which type of FAX service to be used or disable service.
DSP profile	In this configuration operator can define what CODEC to use, how much the play buffer and echo cancellation period. 1. Currently the available CODECs are G.711a, G.711mu, G.723, G.726-16, G.726-24, G.726-32, G.726-40, G.729ab. Besides, both caller and callee need to negotiate a consistent CODEC to be applied in their voice conversation, thus the order of CODECs mean the priority of selection. 2. “Echo Tail” provides the echo cancellation period (i.e. 8, 16, 32 and 128 ms) to decrease the acoustic echo arising in circuit or handset. 3. “Play Buffer Delay” is designed to store the received steaming

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	and play the audio, which can reduce the jitter. “Min Play Buffer Delay” and “Max Play Buffer Delay” are the threshold of that buffer (10~500 ms, and max one ≧ mix.).
Number plan table	The telephone number is composed of three parts, country code, national destination code, and subscriber number, which is defined in ITU-T E.164. Generally user can omit to dial country code and national destination since local exchange should transfer the dialed number as E.164 format before transmitting. Number plan consists of numbers of entries. Each entry has two fields, first is number pattern and second one is translating rule. The entry order plane is significant. The numbering plan feature compares the dialed number with the defined pattern one by one. Once matched, the dial number is translating into E.164 number according to the corresponding rules.
Country code	Some VoIP parameters/settings have different values according to which country operator deploy the IES-1248-51V. To ease the complexity of configuration, we build a list of packages for choice in advance.

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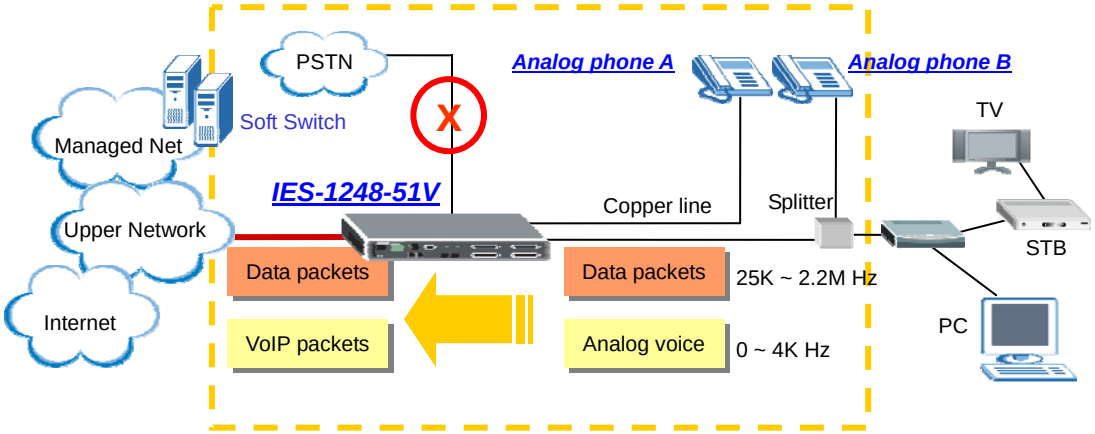
How to set up a VoIP environment

Below is an example of using IES-1248-51V to provide VoIP services. The IES-1248-51V is installed in the operators' estate. The voice signal between the access node and the customer site is still analog, the same as POTS.



Configurations
Soft Switch
SIP Server IP Address: 192.168.10.1, Port: 5060
Registrar Server IP Address: 192.168.10.1, Port: 5060
Proxy Server IP Address: 192.168.10.1, Port: 5060
Authentication:
User A (for Analog phone A)
SIP Number: 111
Password: 111
User B (for Analog phone B)
SIP Number: 112
Password: 112
IES-1248-51V
VoIP Service IP Address: 192.168.10.11/24
VLAN ID for VoIP Service: 2
802.1p Priority for VoIP Service: 7
Analog phone A is connected to port 1
Analog phone B is connected to port 2
The soft switch is connected to ENET2

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We will use the built-in web configurator and take the following steps to configure the IES-1248-51V. It will allow User A and User B to communicate with each other via VoIP service.

1) **System login.**
2) **Set the IES-1248-51V's VoIP service IP address to 192.168.10.11.**
3) **Configure 802.1Q VLAN for VoIP service.**
4) **Create a SIP profile.**
5) **Create a Call Service profile.**
6) **Configure the VoIP settings of the ports.**
7) **Save your configuration.**

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Configure the IES-1248-51V

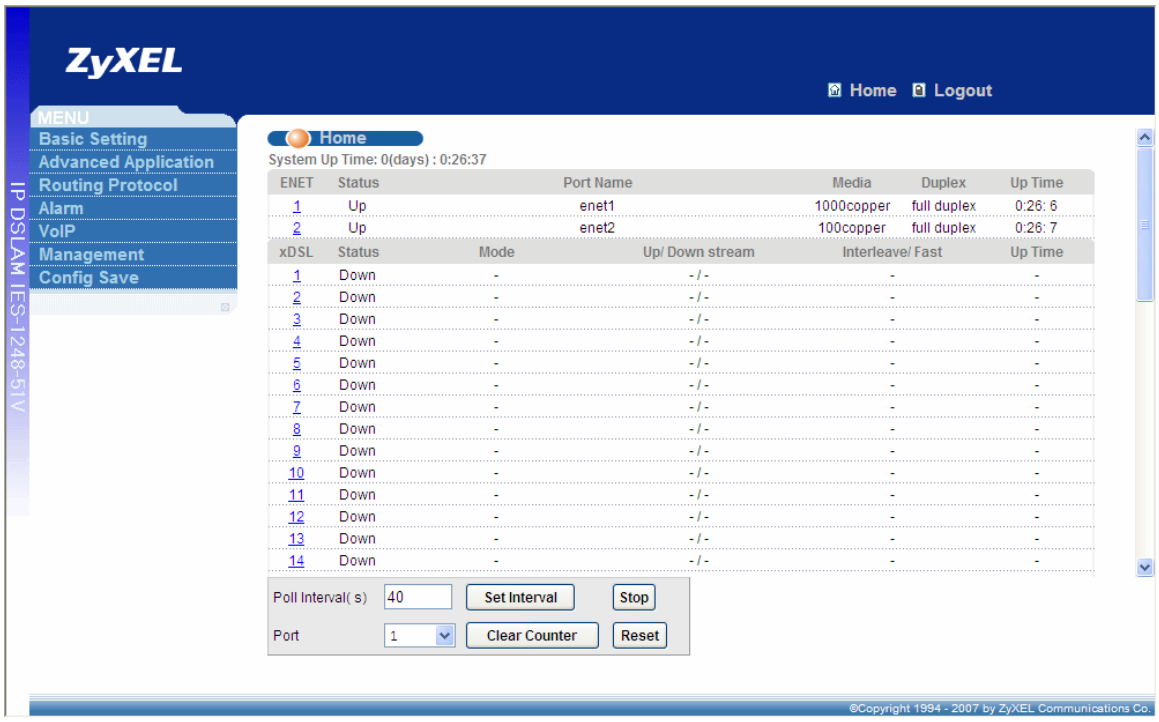
1) System login.

Connect to the IES-1248-51V via Internet browser. The default IP address of IES-1248-51V is **192.168.1.1**. Enter the default username and password to access the device:

Username: **admin**
Password: **1234**

Connect to 192.168.1.1
The server 192.168.1.1 at IES-1248-51V at Tue Feb 13 11:20:27 2007 requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name:
admin
Password:
Remember my password
OK
Cancel

The main screen is the first screen that displays when you access the web configurator.


ZyXEL
Home
Logout
MENU
Basic Setting
Advanced Application
Routing Protocol
Alarm
VoIP
Management
Config Save
IP DSLAM IES-1248-51V
Home
System Up Time: 0(days) : 0:26:37
ENET Status Port Name Media Duplex Up Time
1 Up enet1 1000copper full duplex 0:26: 6
2 Up enet2 100copper full duplex 0:26: 7
xDSL Status Mode Up/ Down stream Interleave/ Fast Up Time
1 Down - -/- - -
2 Down - -/- - -
3 Down - -/- - -
4 Down - -/- - -
5 Down - -/- - -
6 Down - -/- - -
7 Down - -/- - -
8 Down - -/- - -
9 Down - -/- - -
10 Down - -/- - -
11 Down - -/- - -
12 Down - -/- - -
13 Down - -/- - -
14 Down - -/- - -
Poll Interval(s) 40 Set Interval Stop
Port 1 Clear Counter Reset
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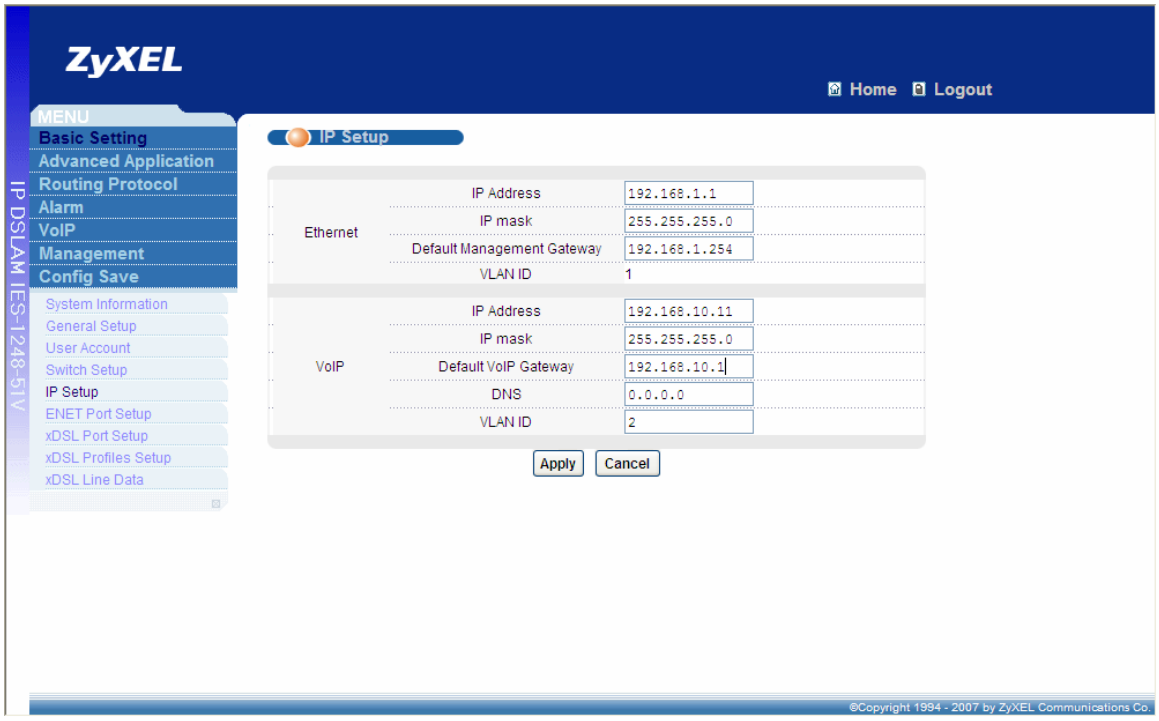
2) Set the IES-1248-51V's VoIP service IP address to 192.168.10.11.

Please take the following steps to set up the IES-1248-51V's VoIP IP configuration.

a. In the navigation panel, click **Basic Setting > IP Setup**. The **IP Setup** screen appears.
b. In the **VoIP** field, for **IP Address**: enter **192.168.10.11** and for **Default VoIP Gateway**: enter **192.168.10.1**.
c. Click the **Apply** button.



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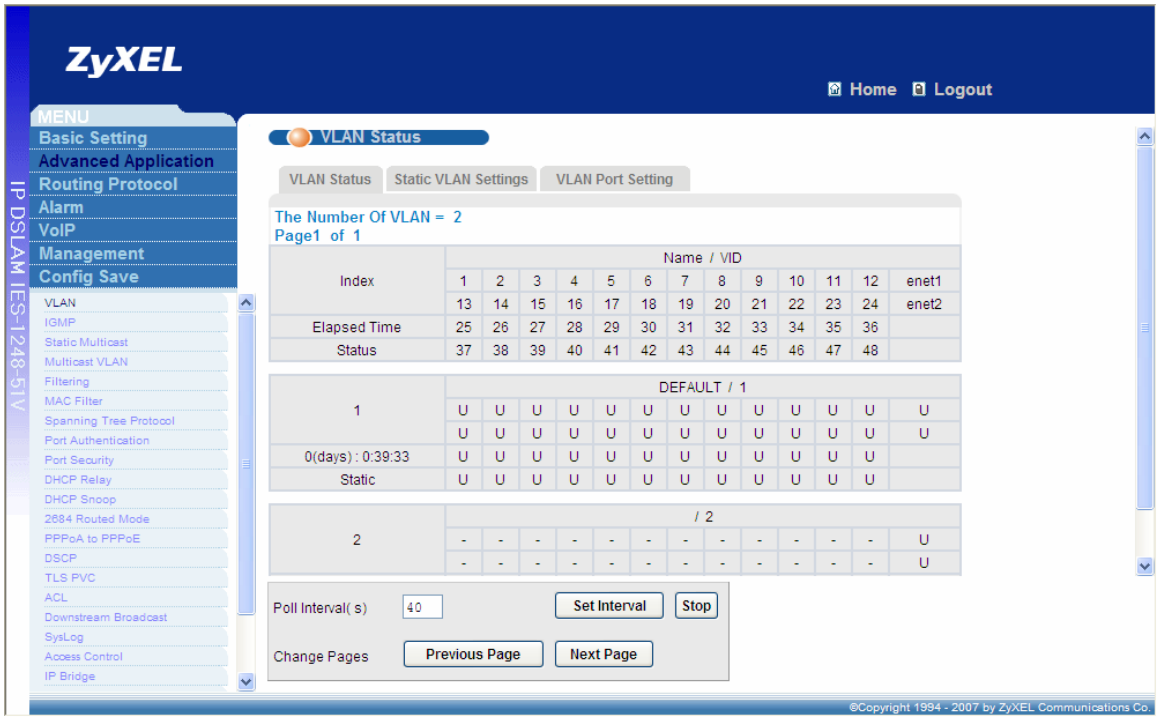
3) Configure 802.1Q VLAN for VoIP service.

Do the following to assign **ENET2** to be a member of the **VLAN 2** group.

a. Click **Advanced Application > VLAN** on the navigation panel. The **VLAN Status** screen appears. Click the **Static VLAN Settings** tab.



b. Click **VID 2**'s index number.

c. Click to select the **Active** check box.

d. In the **ENET2** field, select **Fixed** and clear the **Tx Tagging** check box.

e. Click the **Add** button.

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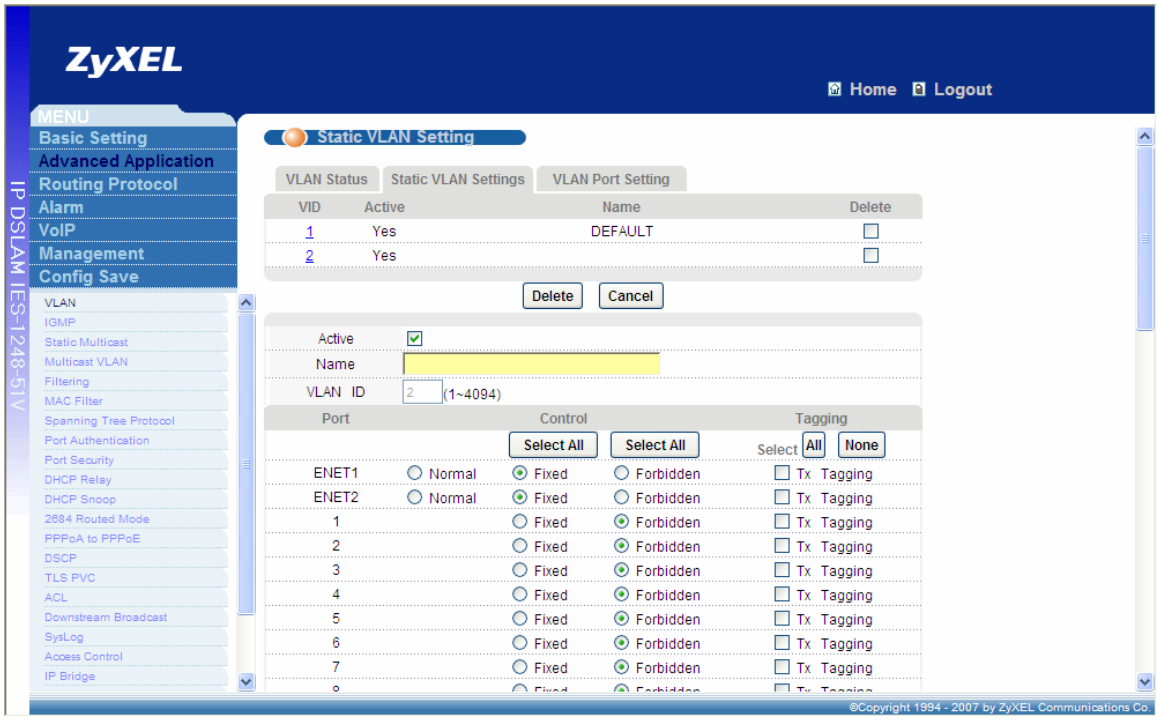
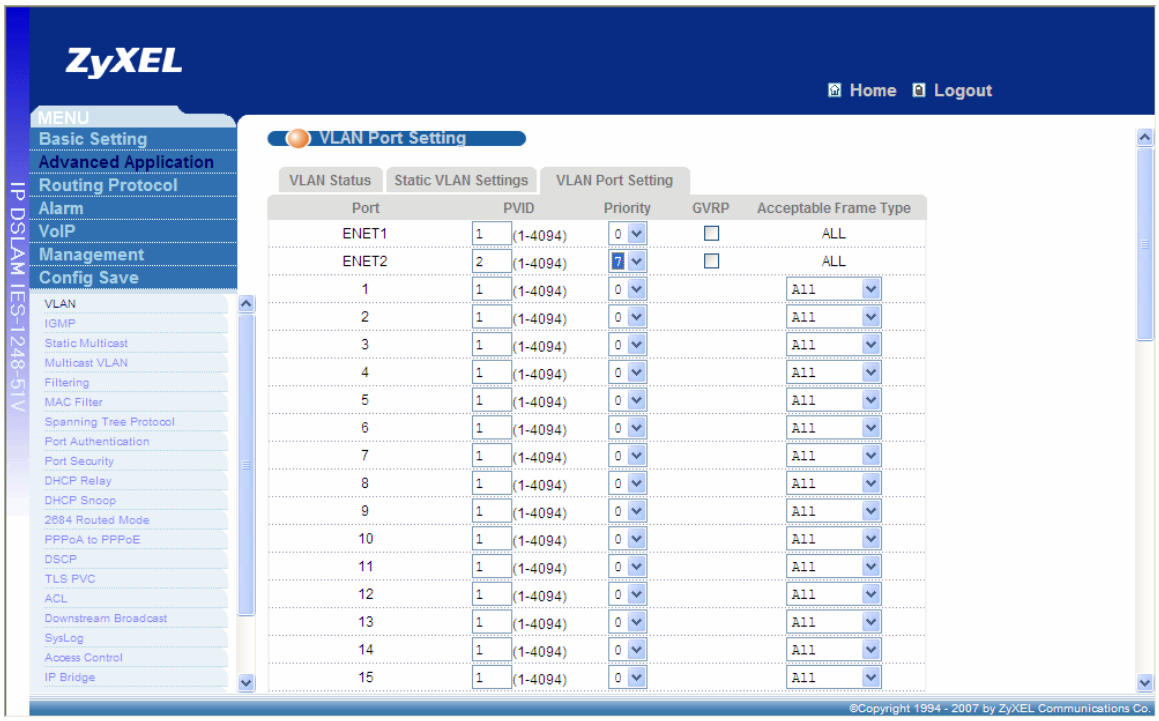


f. Click the **VLAN Port Setting** tab.

g. Type **2** in the **PVID** field of **ENET2**.

h. Select **7** from the **Priority** drop-down list box of **ENET2**. This will assign the highest 802.1p priority to the untagged VoIP frames received on **ENET2**.

i. Click **Apply**.



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4) Create a SIP profile.

Take the following steps to create a SIP profile for the soft switch.

a. Click **VoIP > SIP Profile** on the navigation panel. The **SIP Profile** screen appears.

b. Type a name for the SIP profile. For our example, it is **sipserver**.

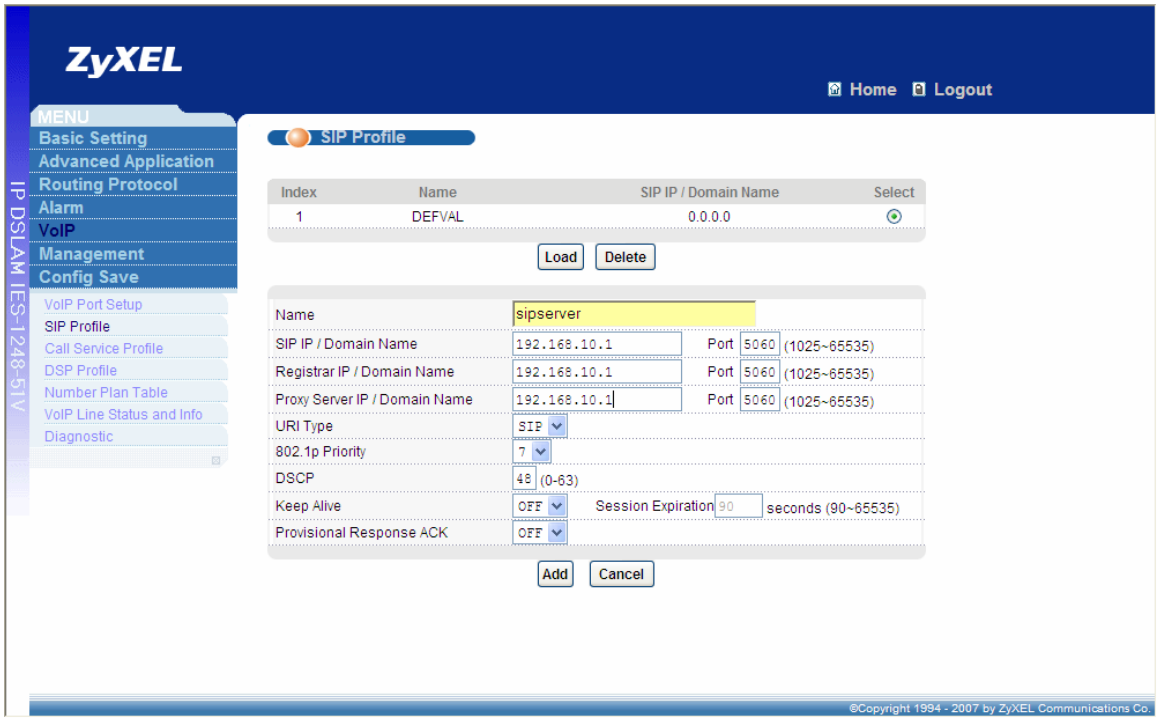
c. Type **192.168.10.1** in the **SIP IP / Doman Name** field and **5060** in the **Port** field.

d. Type **192.168.10.1** in the **Registrar IP / Domain Name** field and **5060** in the **Port** field.

e. Type **192.168.10.1** in the **Proxy Server IP / Domain Name** field and **5060** in the **Port** field.

f. Select **7** from the **802.1p Priority** drop-down list box.

g. Click the **Add** button to create the profile.



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5) Create a Call Service profile.

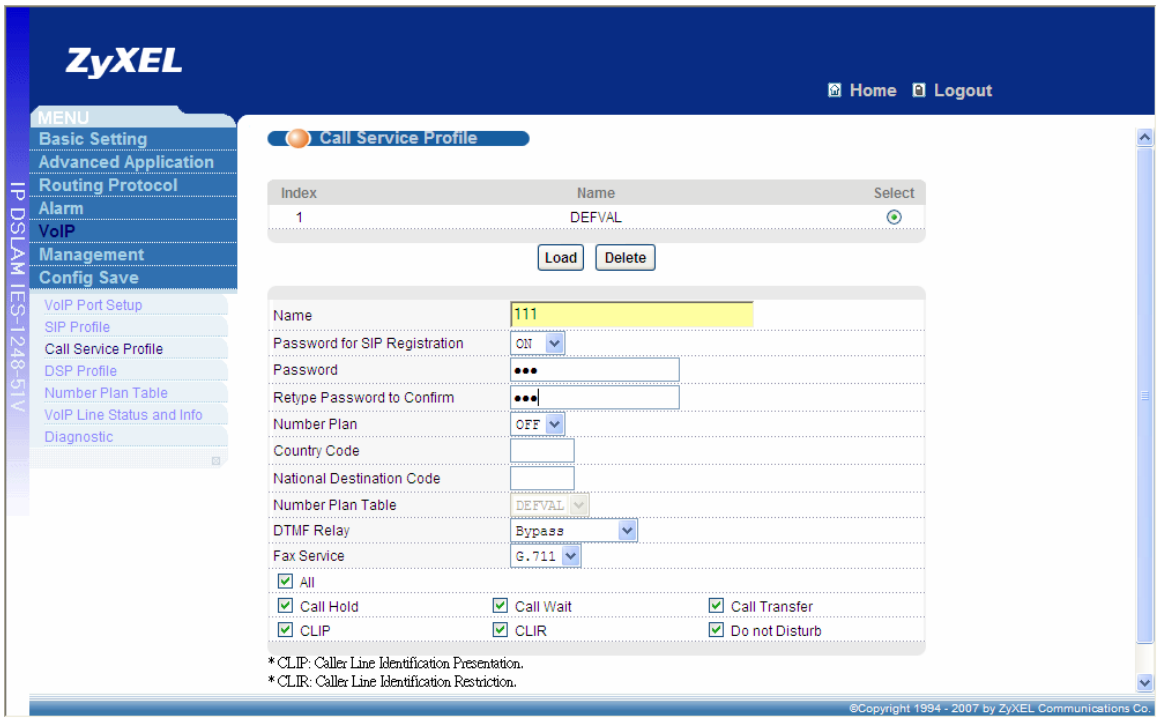
Please do the following to create Call Service profiles for **User A** and **User B** respectively.

a. Click **VoIP > Call Service Profile** on the navigation panel.

b. Type a name for the profile. For our example, it is **111**.

c. Type **111** in the **Password** field, and retype it in the **Retype Password to Confirm** field.

d. Click the **Add** button to create the **111** profile for **User A**.



e. Type **112** in the **Name** field.

f. Type **112** in the **Password** field, and retype it in the **Retype Password to Confirm** field.

g. Click the **Add** button to create the **112** profile for **User B**.

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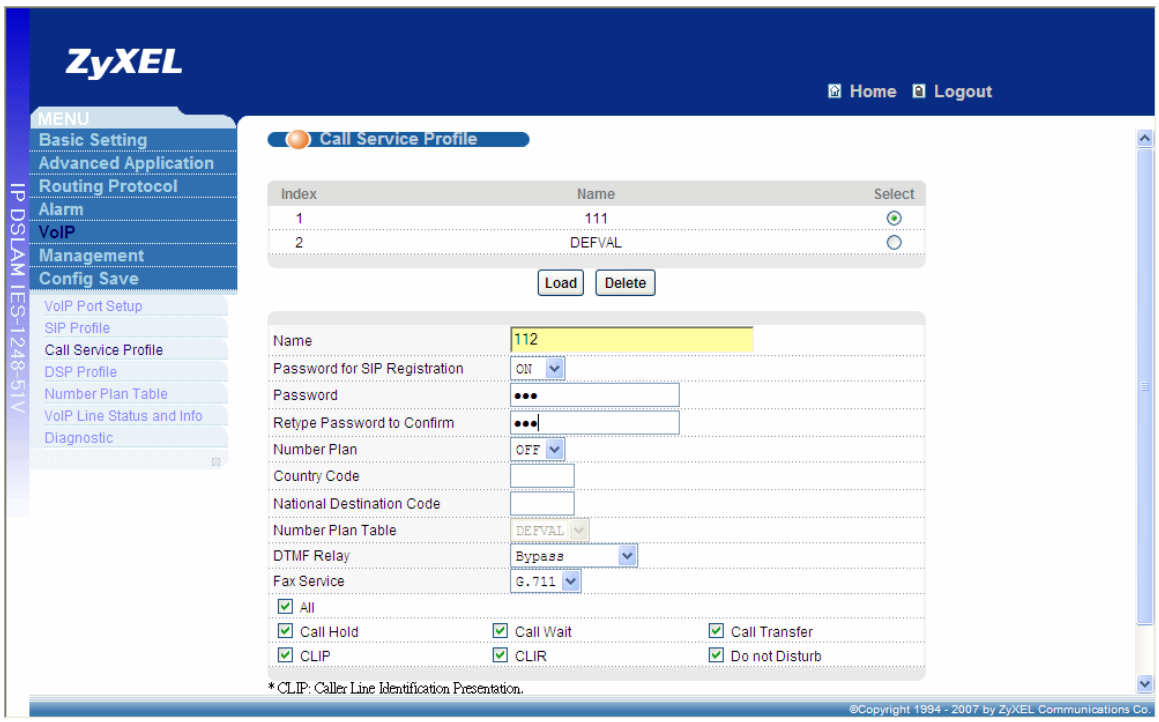

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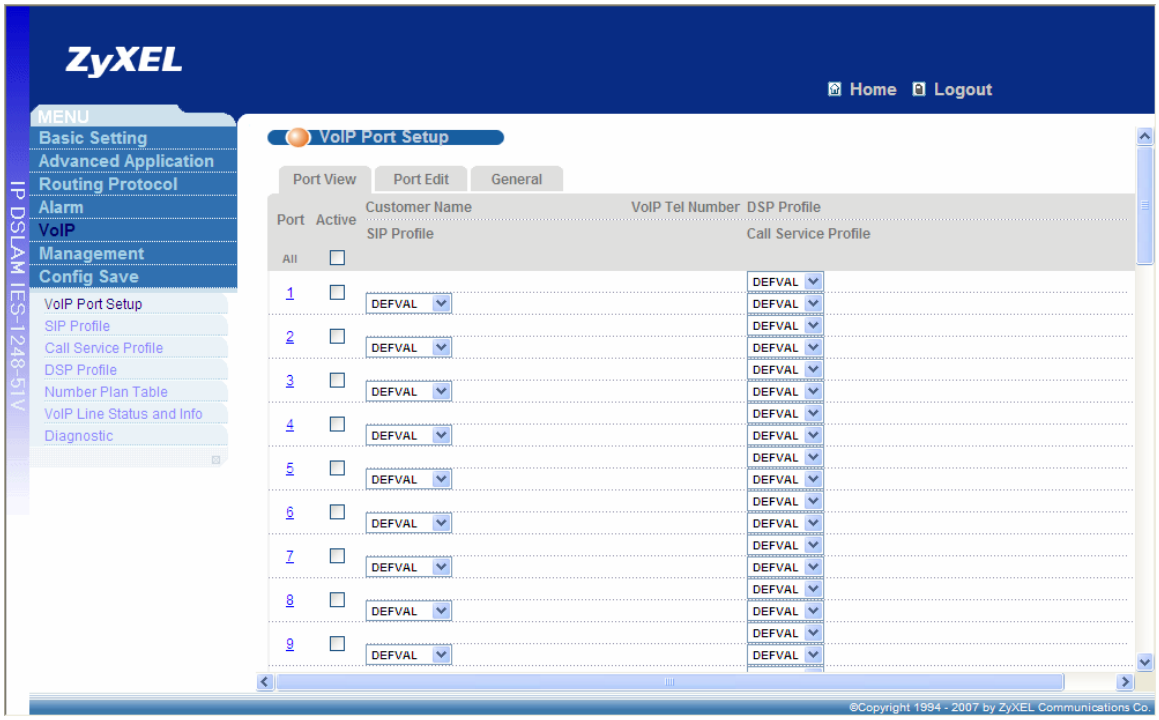
6) Configure the VoIP settings of the ports.

Click **VoIP > VoIP Port Setup** on the navigation panel. The **Port View** screen appears. Click port 1's index number.



a. Click to select the **Enable** check box.

b. Enter **111** in the **VoIP Tel Number** field.

c. Select **sipserver** from the **SIP Profile** dorp-down list box.

d. Select **111** from the **Call Service Profile** drop-down list box.

e. Click **Apply**.

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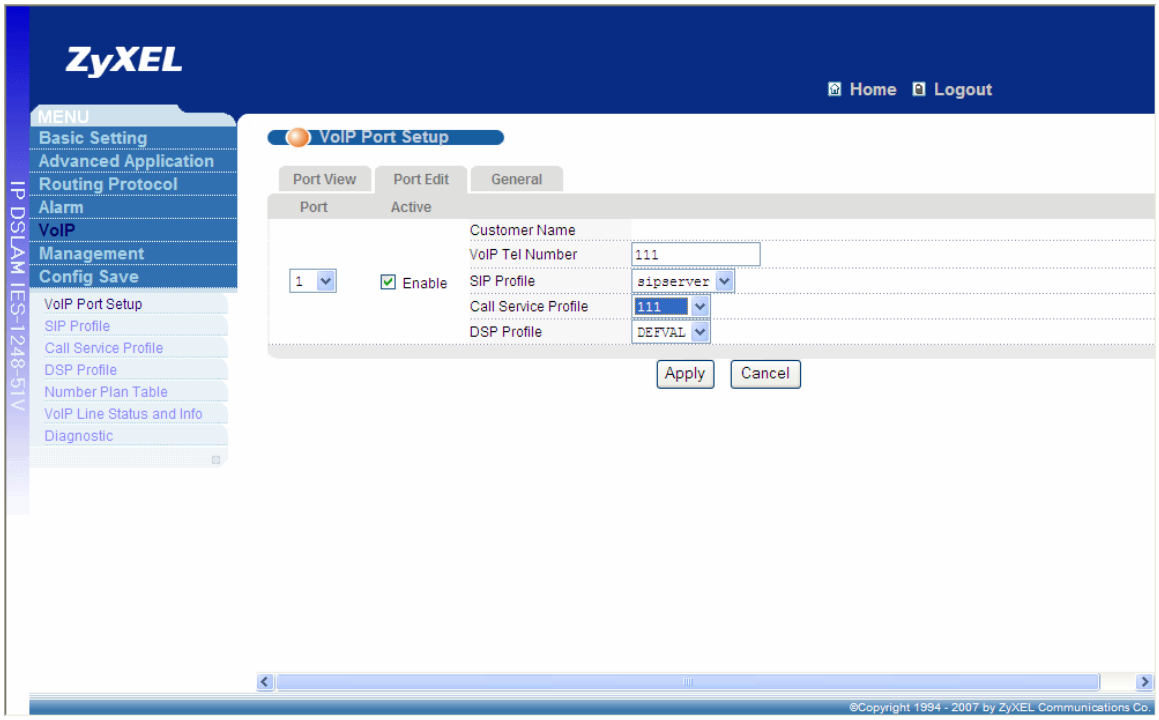

f. Select **2** from the **Port** drop-down list box.

g. Click to select the **Enable** check box.

h. Enter **112** in the **VoIP Tel Number** field.

i. Select **sipserver** from the **SIP Profile** dorp-down list box.

j. Select **112** from the **Call Service Profile** drop-down list box.

k. Click **Apply**.

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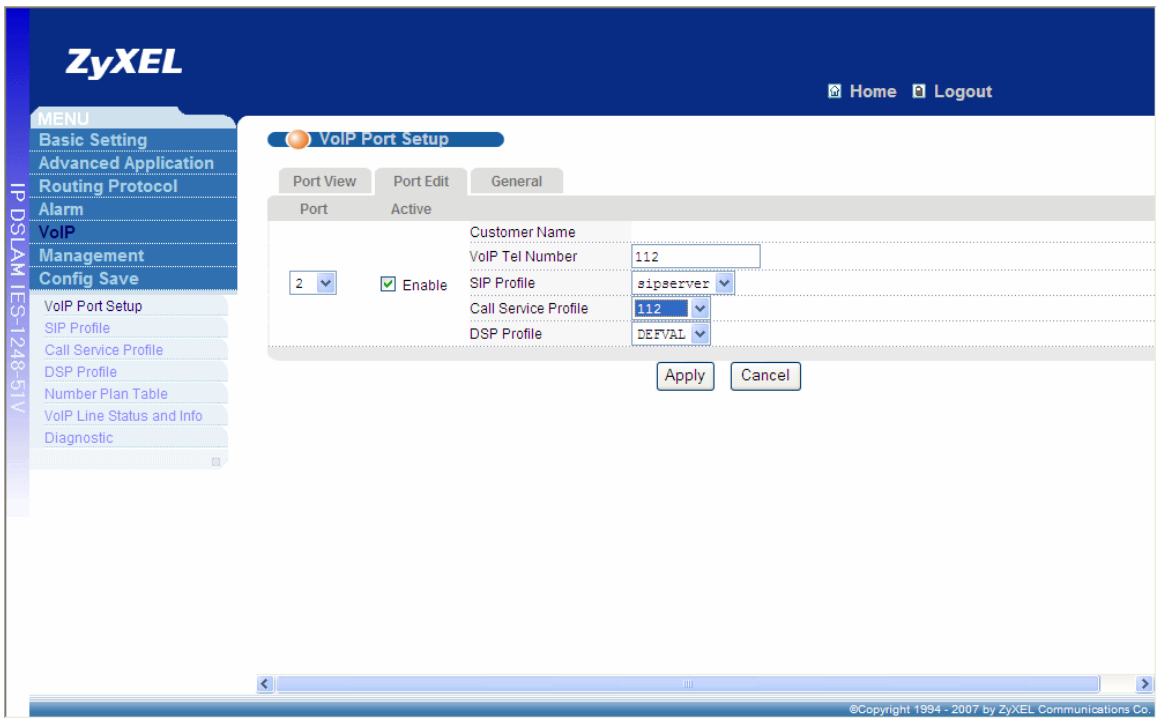
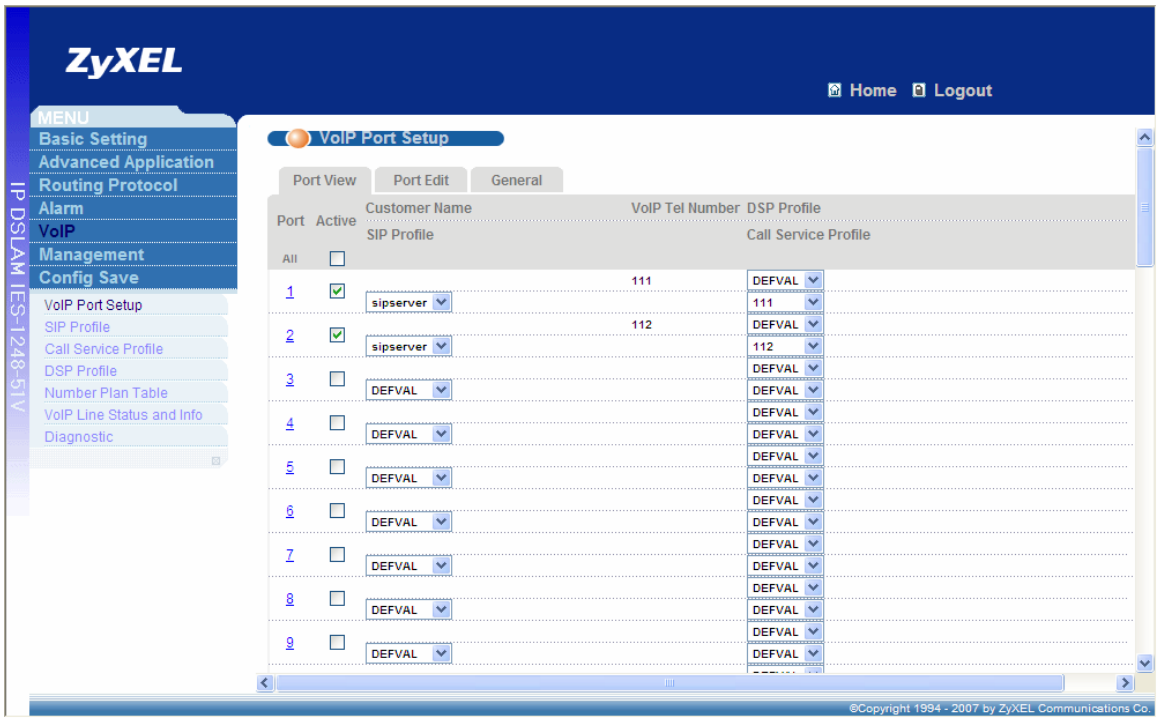


You can see details of the VoIP settings configured on the two ports in the **Port View** screen.



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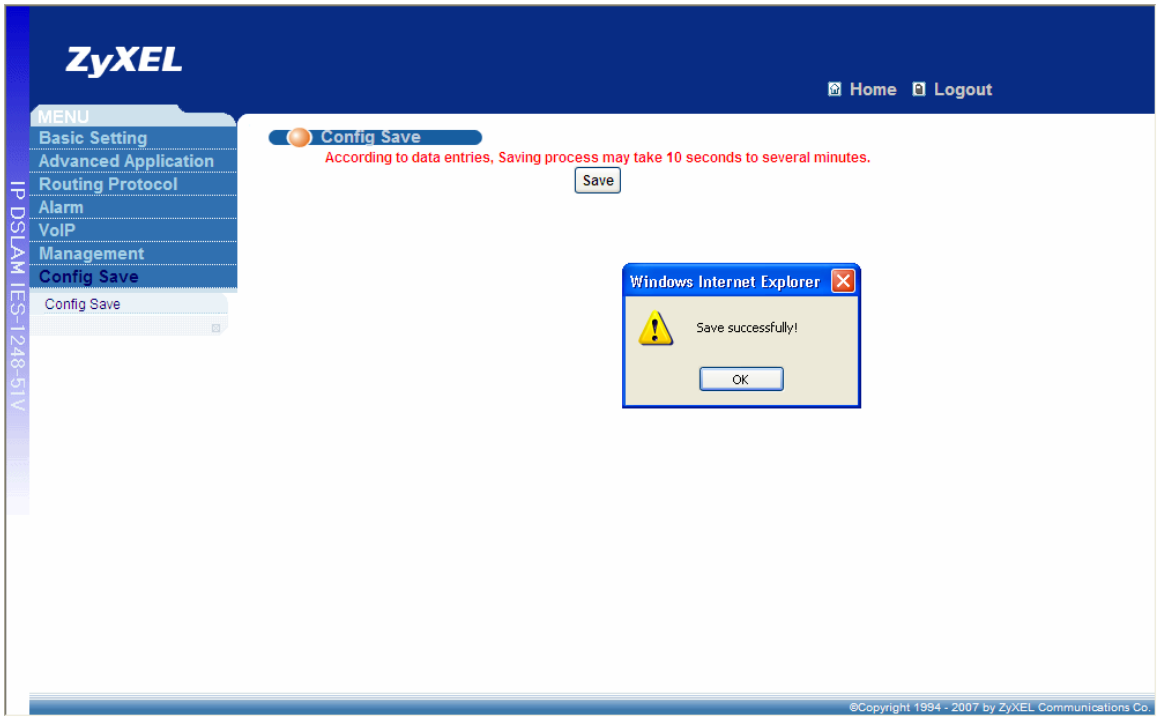
7) Save your configuration.

Click **Config Save > Config Save** on the navigation panel, and then click the **Save** button to save your configuration to nonvolatile memory.



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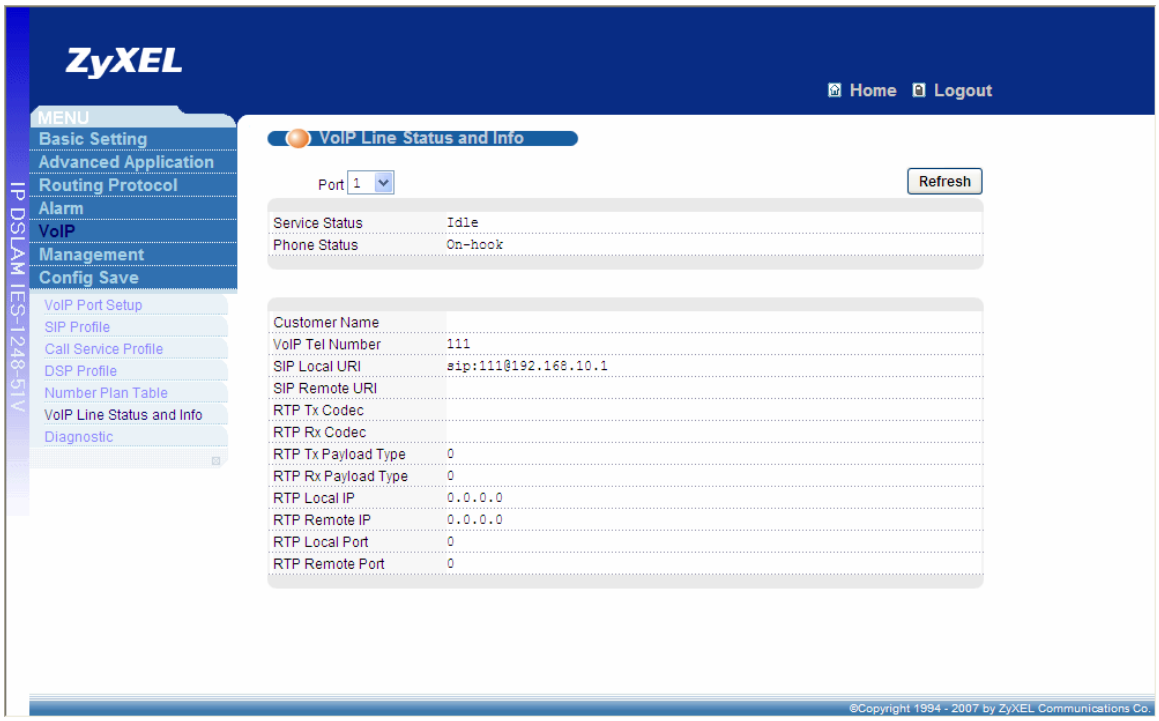
8) VoIP Line Status and Info screen.

After configuring all the ports, you can use this screen to see detailed information about the VoIP configuration currently active on the ports.

Click **VoIP > VoIP Line Status and Info** on the navigation panel. The following screen appears. Now **Service Status** of port 1 is **Idle**.



Some information of RTP and SIP is only shown when communication is established. For the following example, port 1 is the caller, and port 2 is the callee. Their communication is established. This screen shows port 1's line status and information.

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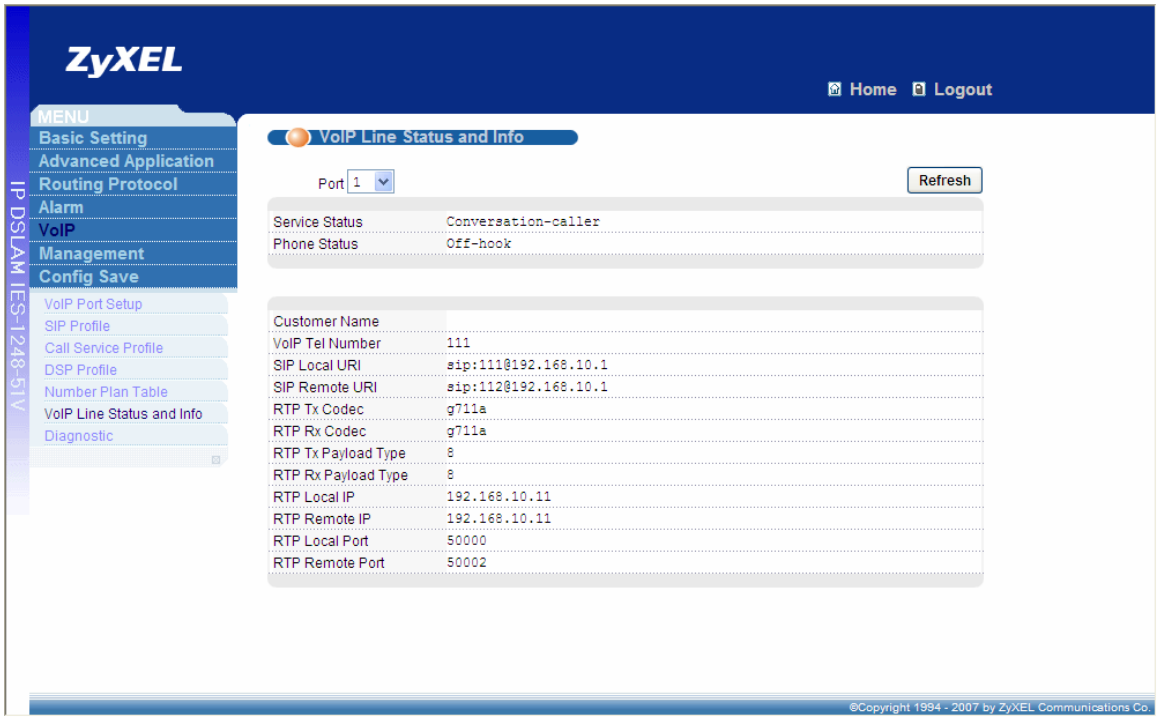
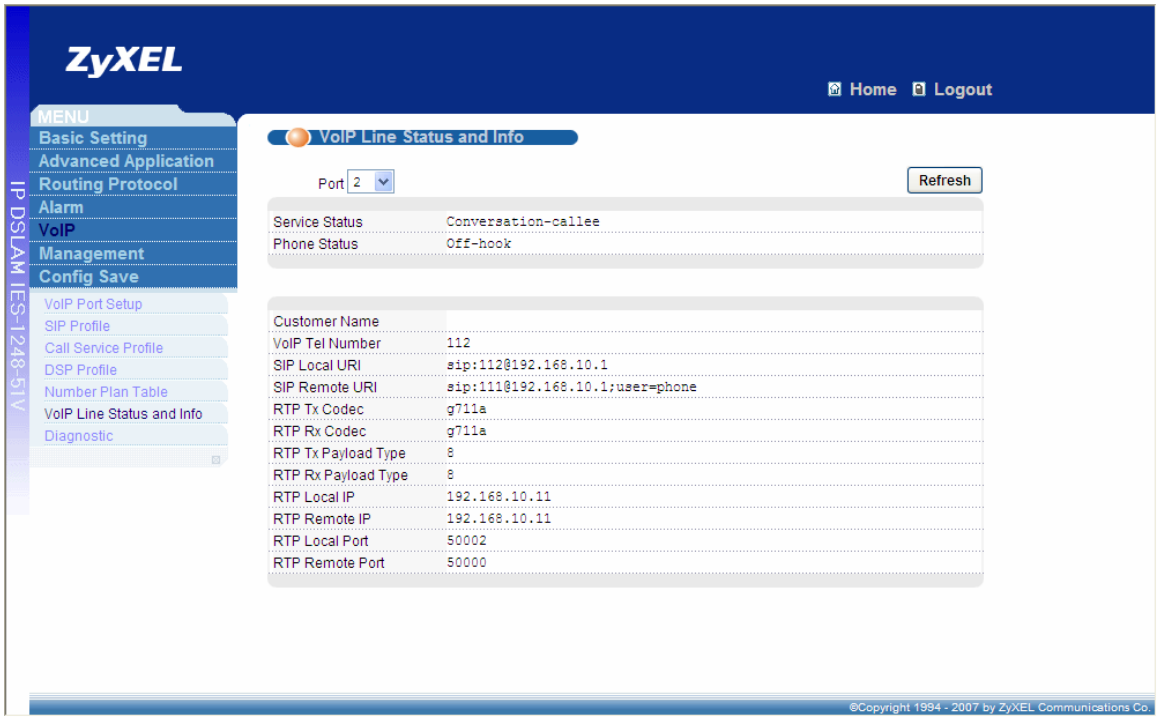


The following screen shows port 2's line status and information.



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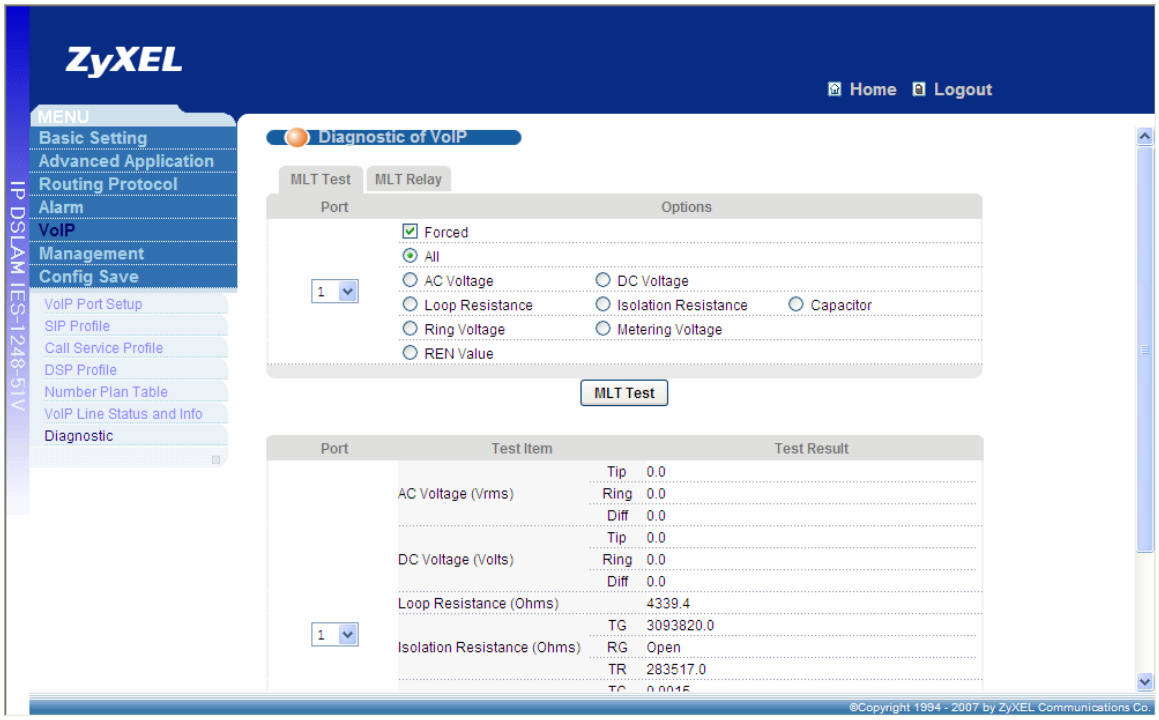
9) MLT Test Screen

You can use this screen to perform a variety of standard Metallic Line Tests on the lines connected to IES-1248-51V's ports. Click **VoIP > Diagnostic > MLT Test** on the navigation panel. The following screen appears.

For the following example, we select **All** to perform all the MLT tests and select **Forced** to perform these tests immediately (even if port 1 is in used). You may need to click **Refresh** to see the statistics in the **Test Result** section.



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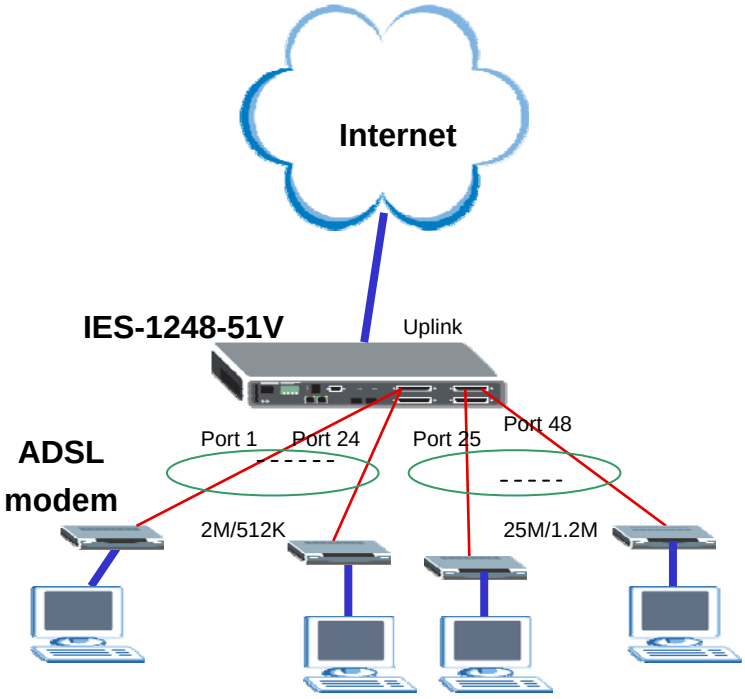
Provide Different DSL Port Speeds to different subscribers

An ISP may provide different Line speeds for each DSL port. In our IES-1248-51V have an easy way to configure the line speed for each port. It can create some profiles which can set different parameters to meet the different users' requirement.
In this application, we will set up two profiles. One is for low speed requirement with upstream/downstream is 2M/512Kbps and the other is for high speed requirement with upstream/downstream is 25M/1.2Kbps. We suppose there are general subscribers from port 1 to port 24 with a low speed profile and some enterprise users from port 25 to port 48 with high speed profile.



How to apply the profile to ports

In this application, we need to configure IES-1248-51V and ADSL CPE. We use ZyXEL Prestige 660R-61 CPE here.

1. IES-1248-51V Settings

1.1 Profiles settings

Click Basic Setting, xDSL Profiles Setup in the navigation panel to display configuration screen as shown.

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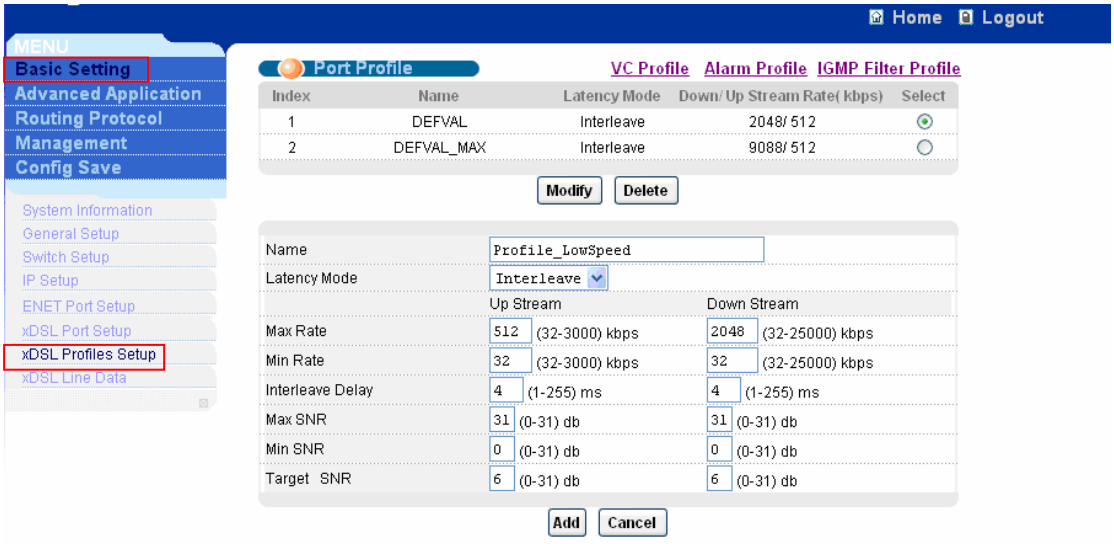
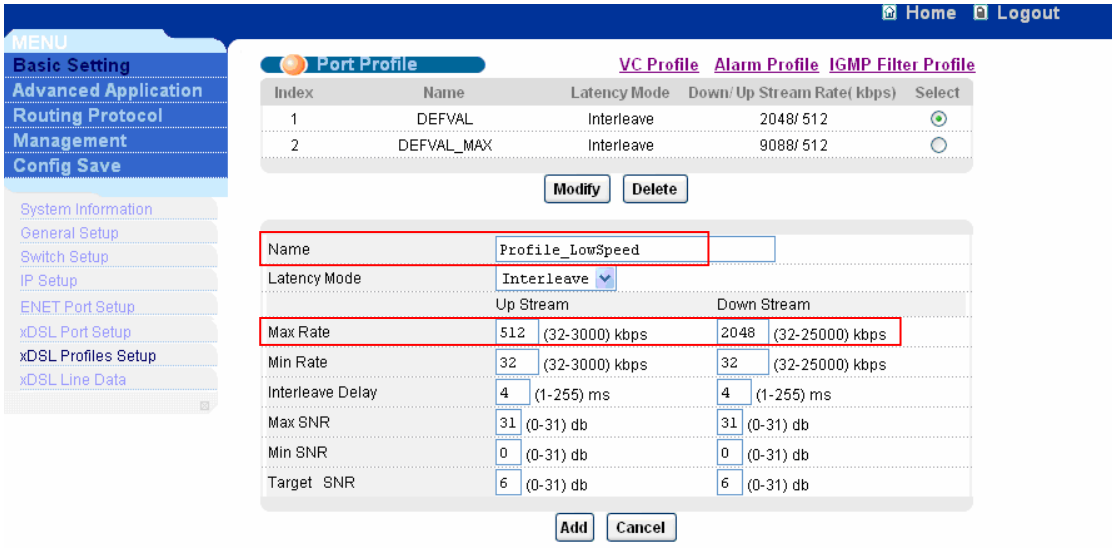


Set up Low Speed Profile. Give this profile a name like Profile_LowSpeed and input the MaxRate for Up Stream and Down Stream. In this case, we set 512Kbps and 2048Kbps for Up Stream and Down Stream.



Set up High Speed Profile. Give this profile a name like Profile_HighSpeed and input the MaxRate for Up Stream and Down Stream. In this case, we set 1280Kbps and 24992Kbps for Up Stream and Down Stream.

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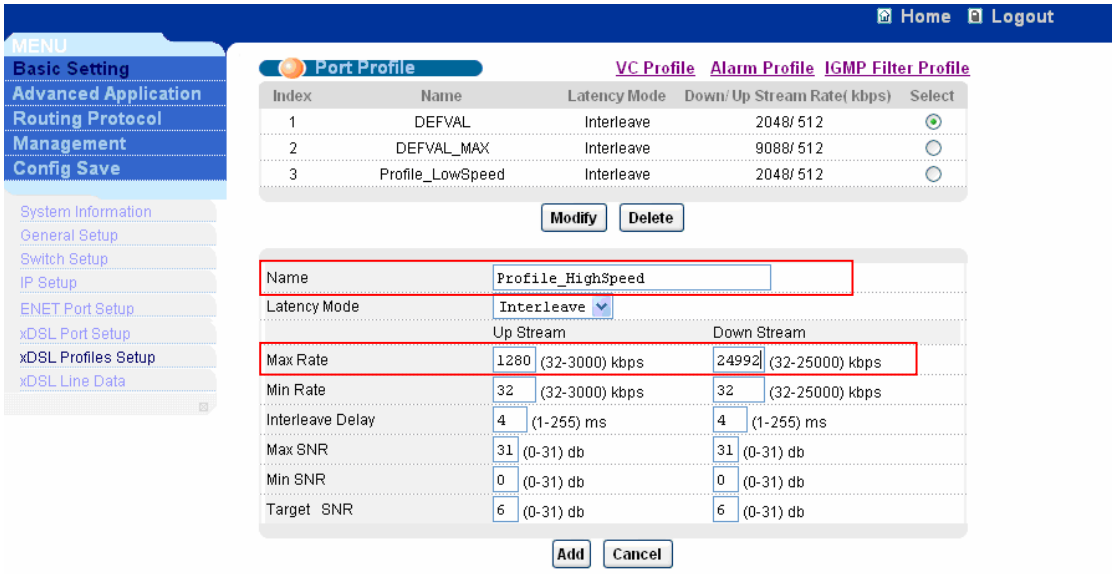
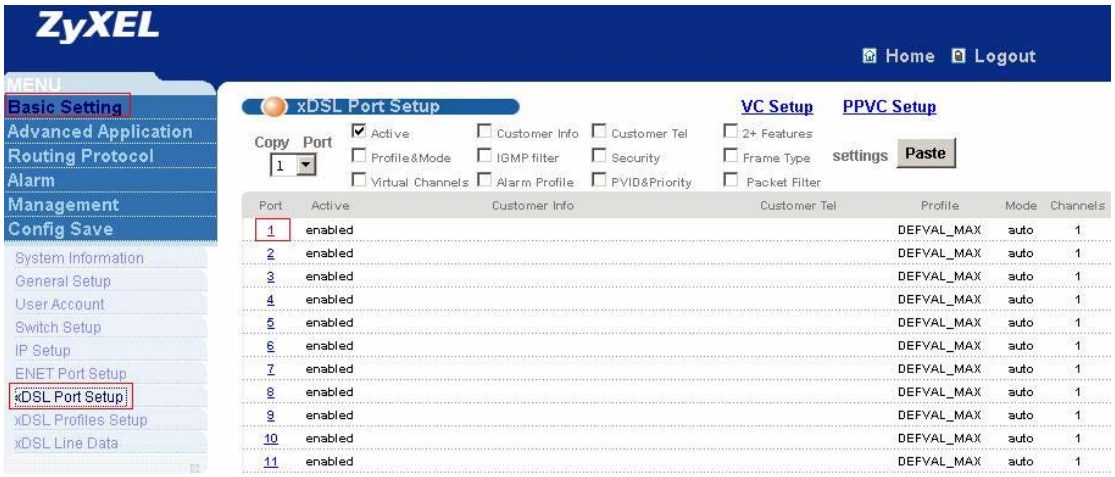
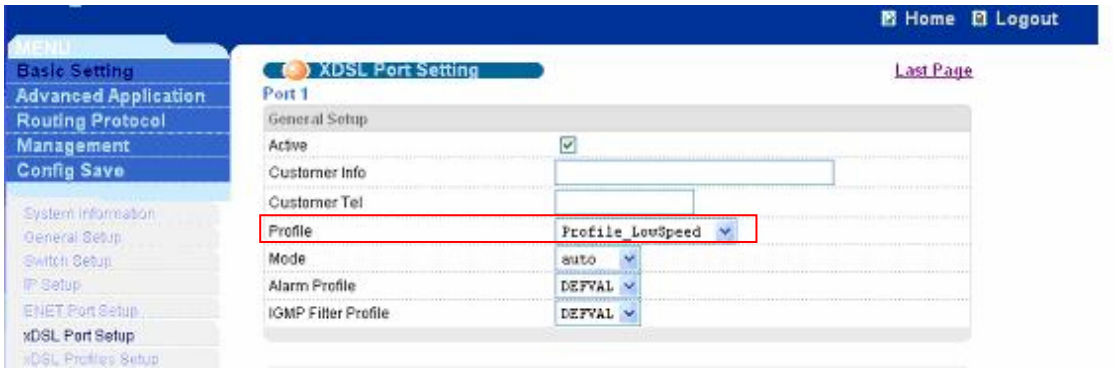


1.2 Profile Assignment

Click **Basic Setting**, **xDSL Port Setup** in the navigation panel to display configuration screen as shown.



Assign Profile_LowSpeed to port 1. Click a number **1** in the Port index field to enter Port setup screen. Select the Profile_LowSpeed profile and press **Apply** button.



Copy the settings of port 1 to the ports from 2 to 24. After finishing port 1 setting, the screen will be back to the xDSL port Setting screen. Select port 1 in **Copy Port**

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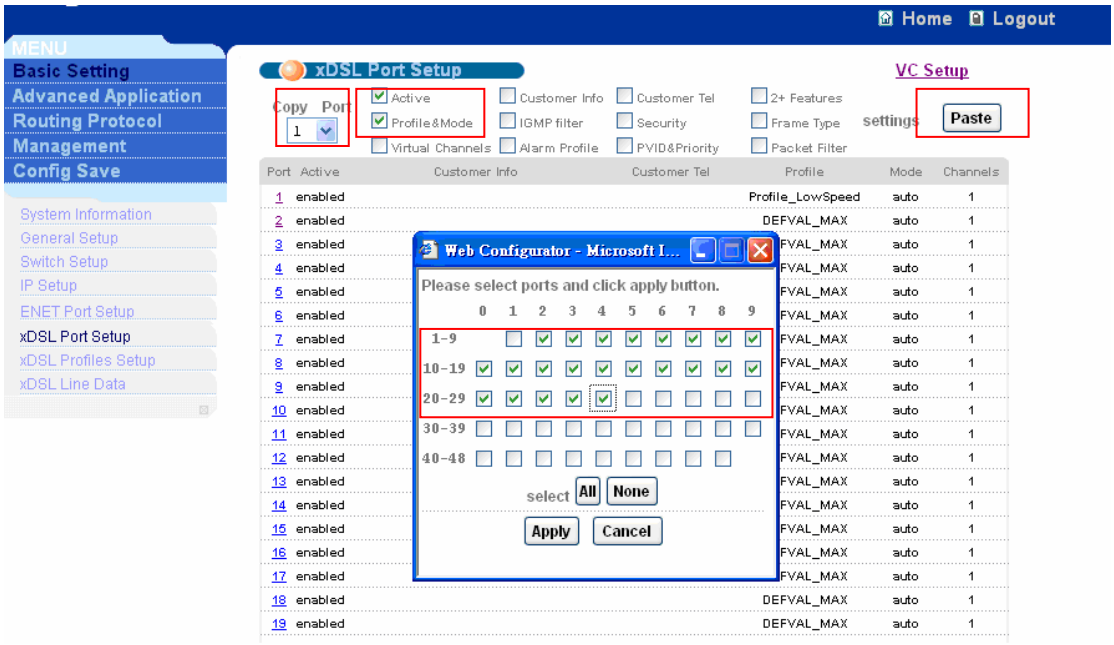
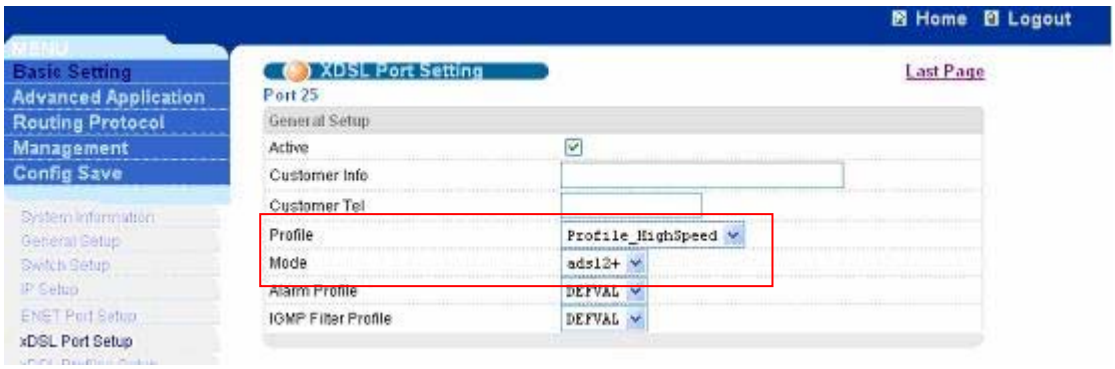
combobox. Check the **Active** and **Profile&Mode**. After press the **Paste** button. It will pop up a screen to select the ports. Select the ports you want to copy the configuration to and press **Apply** button. The settings of port 1 will be copied to other ports.



For the high speed profile, you can set the Profile_HighSpeed to port 25. You also can select ADSL2+ mode in **Mode** combobox. That will fix the mode on ADSL2+ mode.



Copy the settings of port 25 to the ports from 26 to 48. You can follow the same procedures as port 1.

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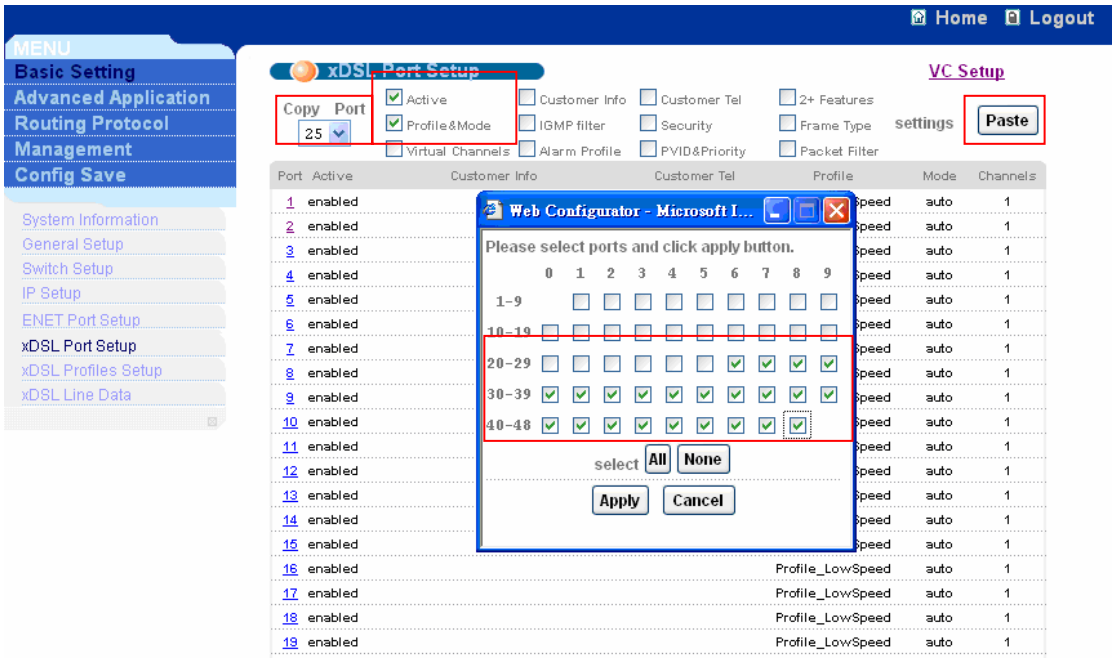
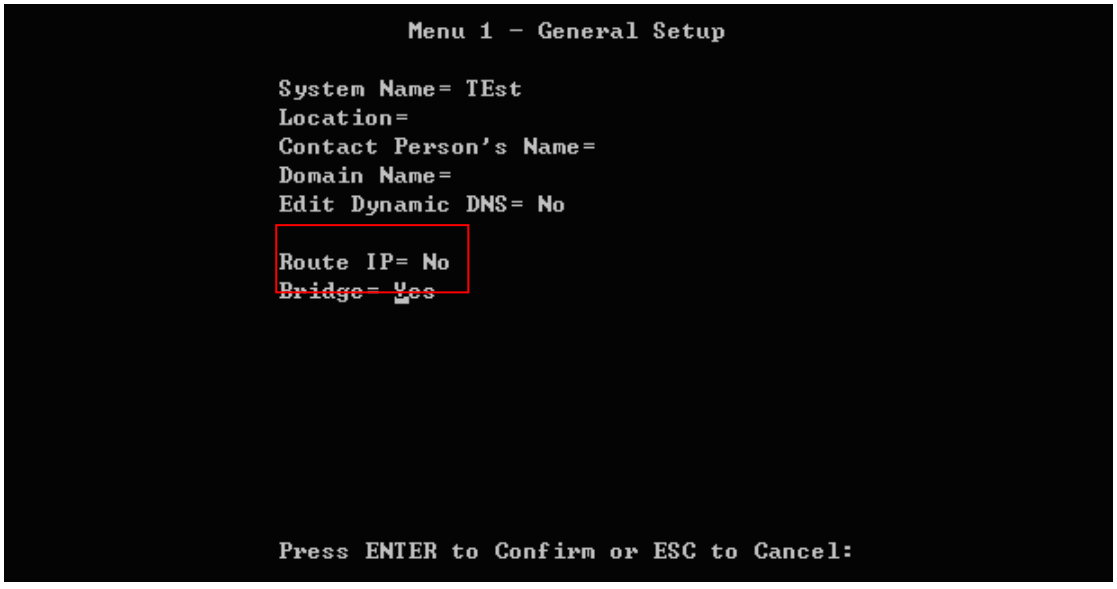


2. Prestige 660R-61 Settings

We configure Prestige 660R-61 as bridge mode. The default VPI/VCI of IES-1248-51V is 0/33. So we need to set up such values. Prestige 660R-61 has a Telnet server inside. We need to configure it via Telnet.

2.1 Menu1: General Setup

Go to Menu 1. In this menu, we must set “Rout IP = NO” and “Bridge = YES”.



2.2 Menu4: Internet Access Setup

The encapsulation must be RFC 1483 for bridge mode. The Multiplexing should be the same as IES-1248-51V. The LLC-based is default mode of IES-1248-51V. Additionally, we must check if the VPI/VCI is the same as IES-1248-51V. The default VPI/VCI of IES1248-51V is 0/33.

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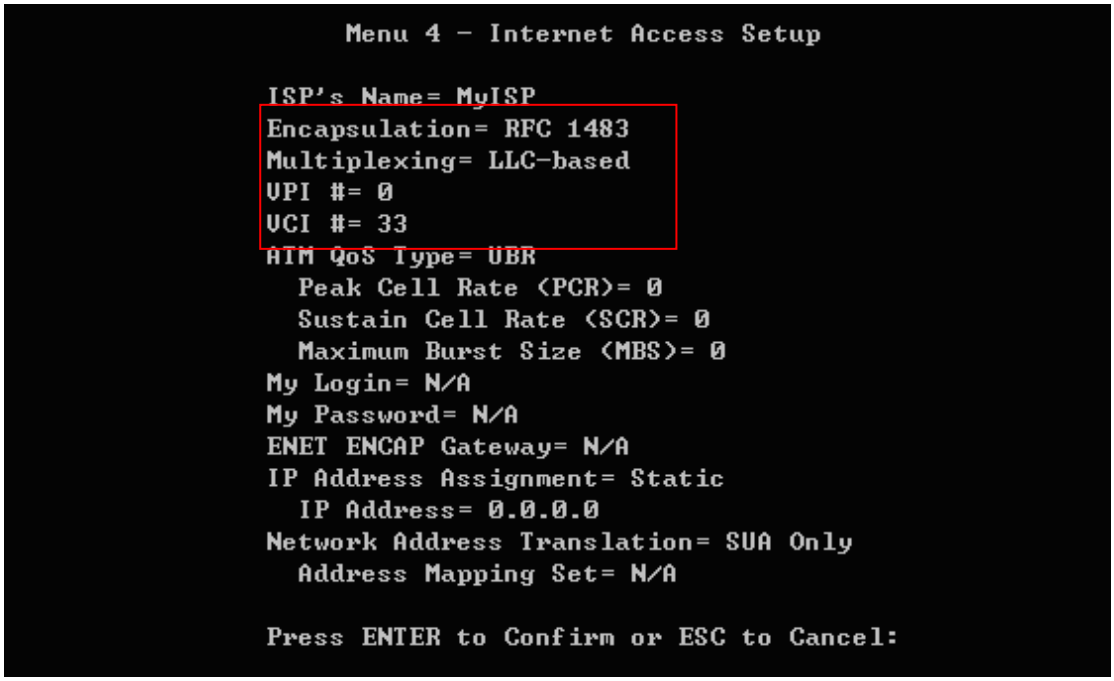
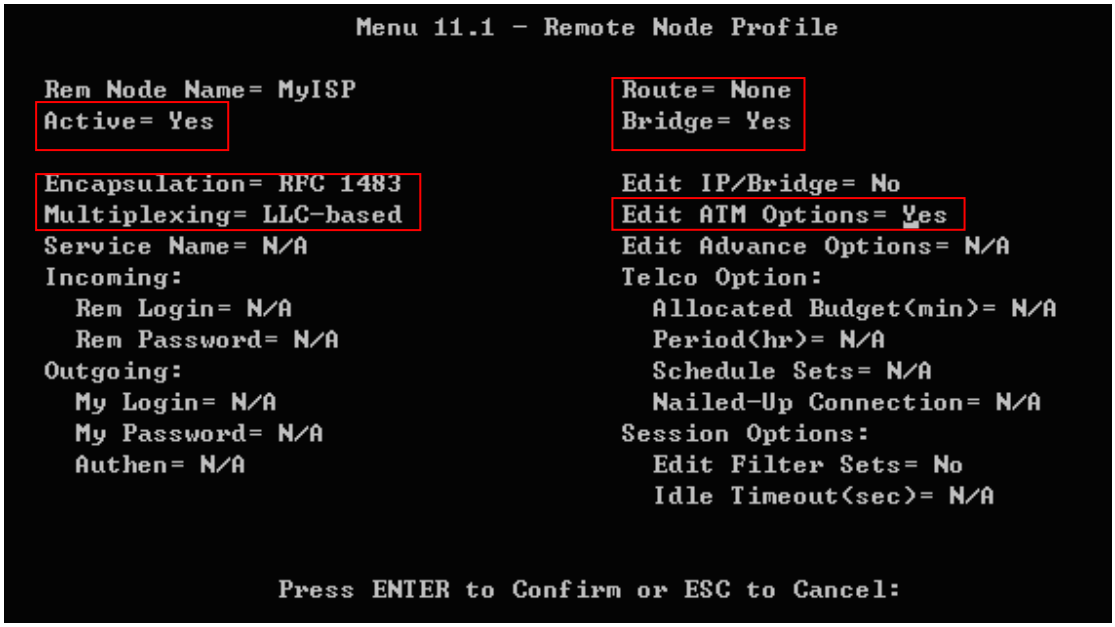

Menu 4 - Internet Access Setup
ISP's Name= MyISP
Encapsulation= RFC 1483
Multiplexing= LLC-based
VPI #= 0
VCI #= 33
ATM QoS Type= UBR
Peak Cell Rate (PCR)= 0
Sustain Cell Rate (SCR)= 0
Maximum Burst Size (MBS)= 0
My Login= N/A
My Password= N/A
ENET ENCAP Gateway= N/A
IP Address Assignment= Static
IP Address= 0.0.0.0
Network Address Translation= SUA Only
Address Mapping Set= N/A
Press ENTER to Confirm or ESC to Cancel:

2.3 Menu11.1: Remote Node Profile

In menu11.1, we should activate this profile with "Active= Yes". The Encapsulation and the Multiplexing are the same as the menu 4. Setting "Edit ATM Options=Yes" will enter Menu 11.6.



2.4 Menu11.6: Remote Node ATM Layer Options

Check the values above are the same as the IES-1248-51V.

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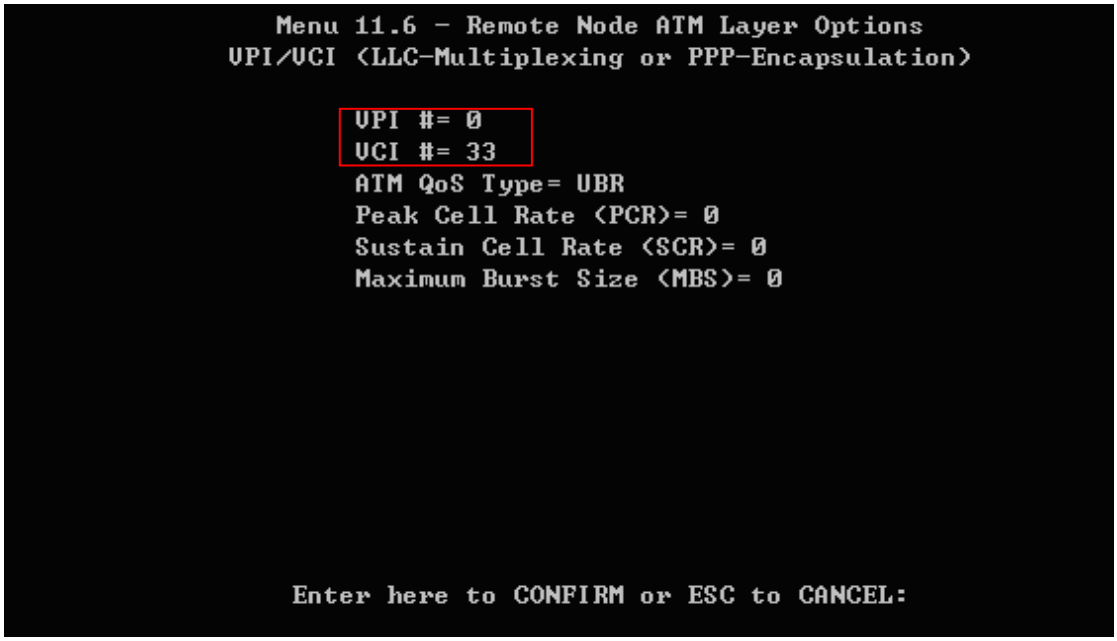
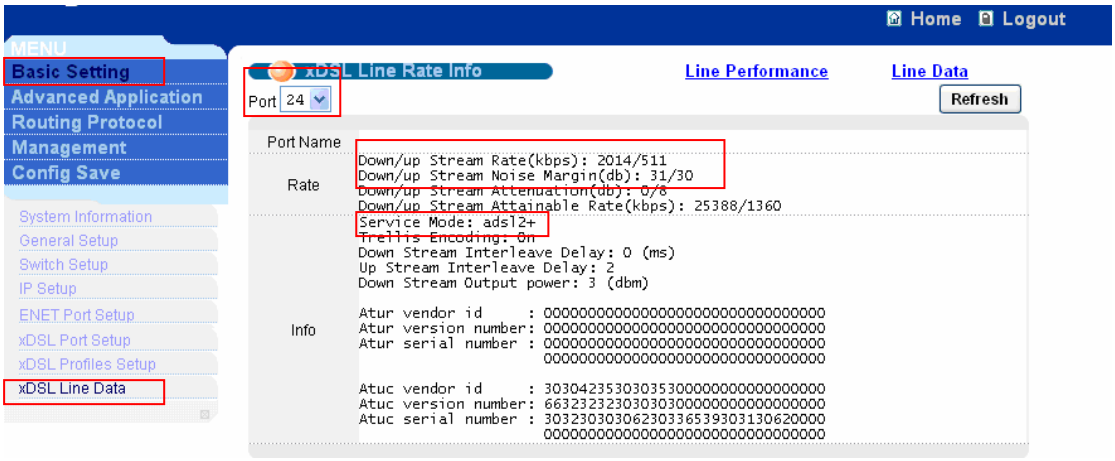

Menu 11.6 - Remote Node ATM Layer Options
VPI/VCI (LLC-Multiplexing or PPP-Encapsulation)
VPI #= 0
VCI #= 33
ATM QoS Type= UBR
Peak Cell Rate (PCR)= 0
Sustain Cell Rate (SCR)= 0
Maximum Burst Size (MBS)= 0
Enter here to CONFIRM or ESC to CANCEL:

You can click **Basic Setting** and **xDSL Line Data** in navigation Panel to display configuration screen as shown. Select the port connected to the IES-1248-51V. You will see the link speed and link mode.



How to configure 802.1Q VLAN

A VLAN (Virtual Area Network) allows a physical network to be partitioned into multiple logical networks. Stations on a logical network belong to one group called VLAN group. A station can belong to more than one group. The stations on the same VLAN group can communicate with each other. With VLAN, a station cannot directly talk to or hear from stations that are not in the same VLAN groups.

We want to deploy VALN environment in this application. The following figure shows the VLAN example. Two PCs connect to the port 1 and port 2 of the line card

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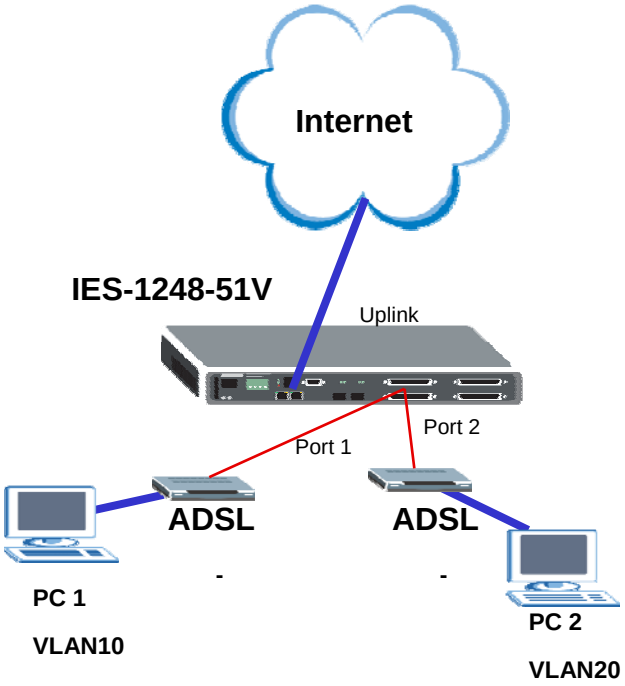
and belong to different VLAN. One is VLAN 10 and the other is VLAN 20. So they can't communication with each other. But both PC 1 and PC 2 can connect to Internet.



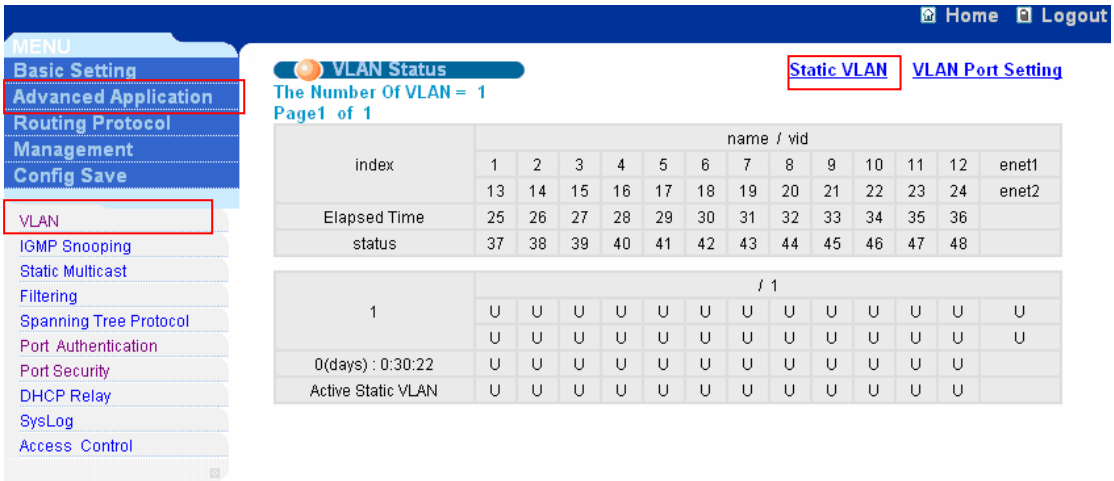
How to set up a VLAN environment.

In this application, we need to configure IES-1248-51V and ADSL CPE. We use ZyXEL Prestige 660R-61 CPE here. Because the two ports belong to different VLAN want to go to the Internet via Uplink port of IES-1248-51V, we need to set up an extra VLAN and let the two ports be members of this VLAN.

1. IES-1248-51V Settings

1.1 VLAN settings

Click **Advanced Application**, **VLAN** in the navigation panel to display configuration screen as shown. Click **Static VLAN** to set the VLAN parameters.



Add VLAN10. Assign Port 1, ENET1 and ENET2 to be members of VLAN10 as shown.

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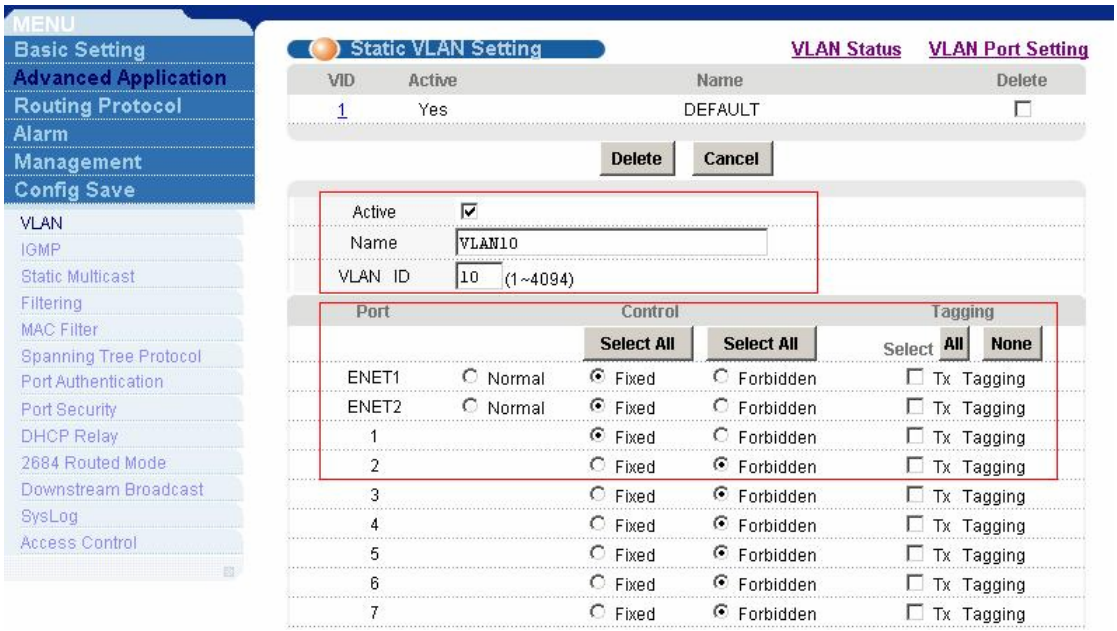
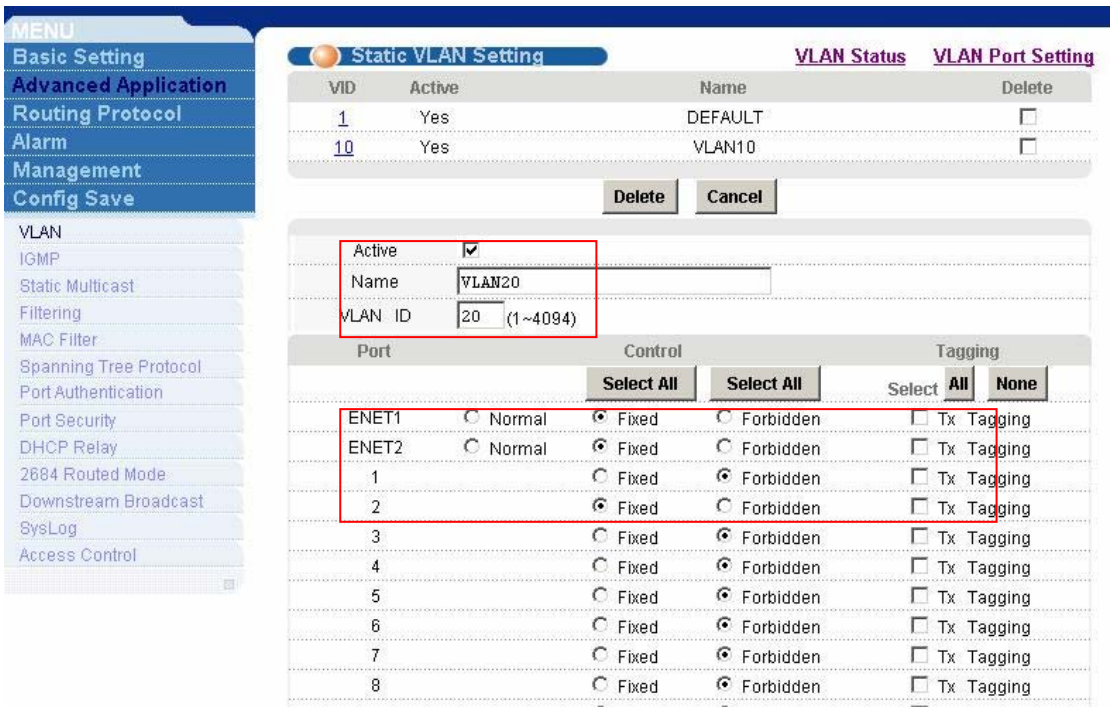


Add VLAN20. Assign Port 2, ENET1 and ENET2 to be members of VLAN20 as shown.



Add VLAN200. Assign Port 1, Port2, ENET1 and ENET2 to be members of VLAN200 as shown.

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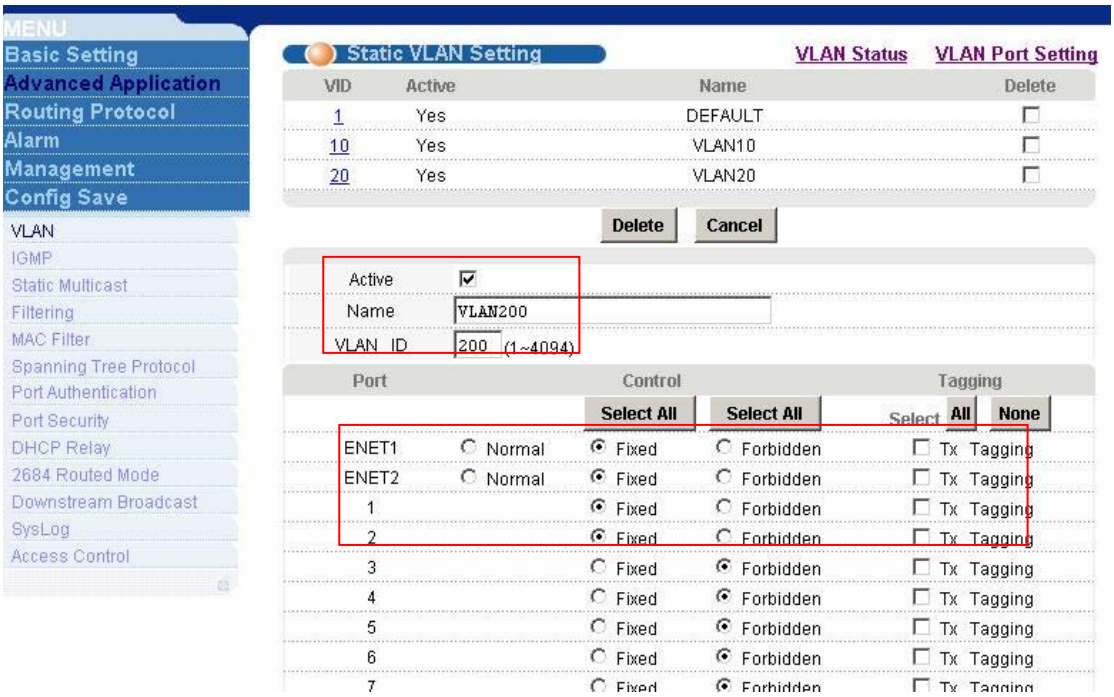
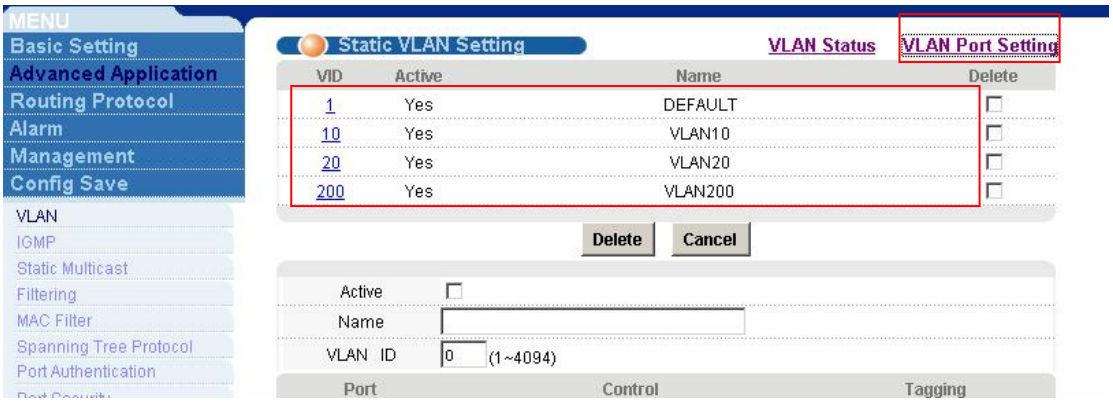


1.2 PVID settings

After set up the three VLAN, we can see Vlan10, Vlan20 and Vlan200 as shown. Now, click **VLAN Port Setting** to set the PVID.



We assign VLAN 200(PVID) to ENET1, ENET2. Also, we assign VLAN 10 and VLAN 20 to Port1 and port2, respectively as shown.

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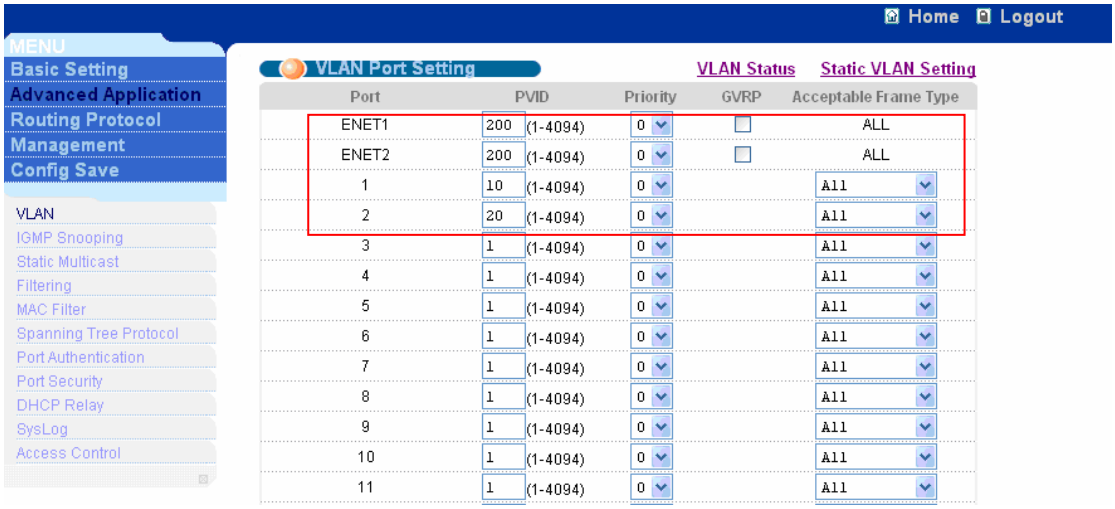
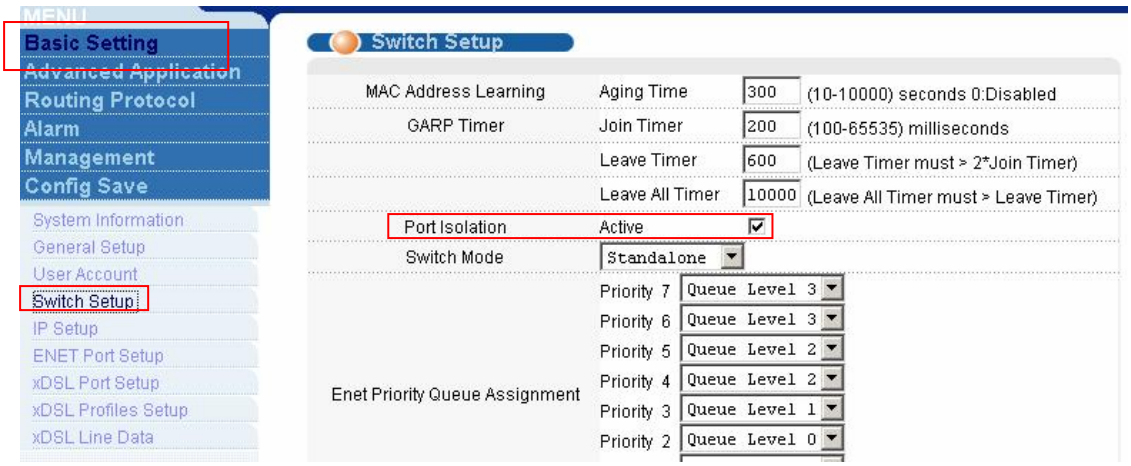


1.3 Port Isolation

If we just want to isolate ports of IES-1248-51V and don't want to set any VLAN, there is another easy way to do this. Click **Basic setting**, **Switch Setup** in navigation panel to display configuration screen as shown. Check **Port isolation Active** check box.



2. Prestige 660R-61 Settings

Please refer to the procedures in previous application.

Triple play Application

The IES-1248-51V allows you to use different channels(also called Permanent Virtual Circuits or PVCs) for different services. Define channels on each DSL port for different services and assign each channel a priority, a VLAN and ATM Quality of Service (QoS). The ATM QoS allows you to regulate the average rate and fluctuations of data transmission. This helps eliminate congestion to allow transmission of real

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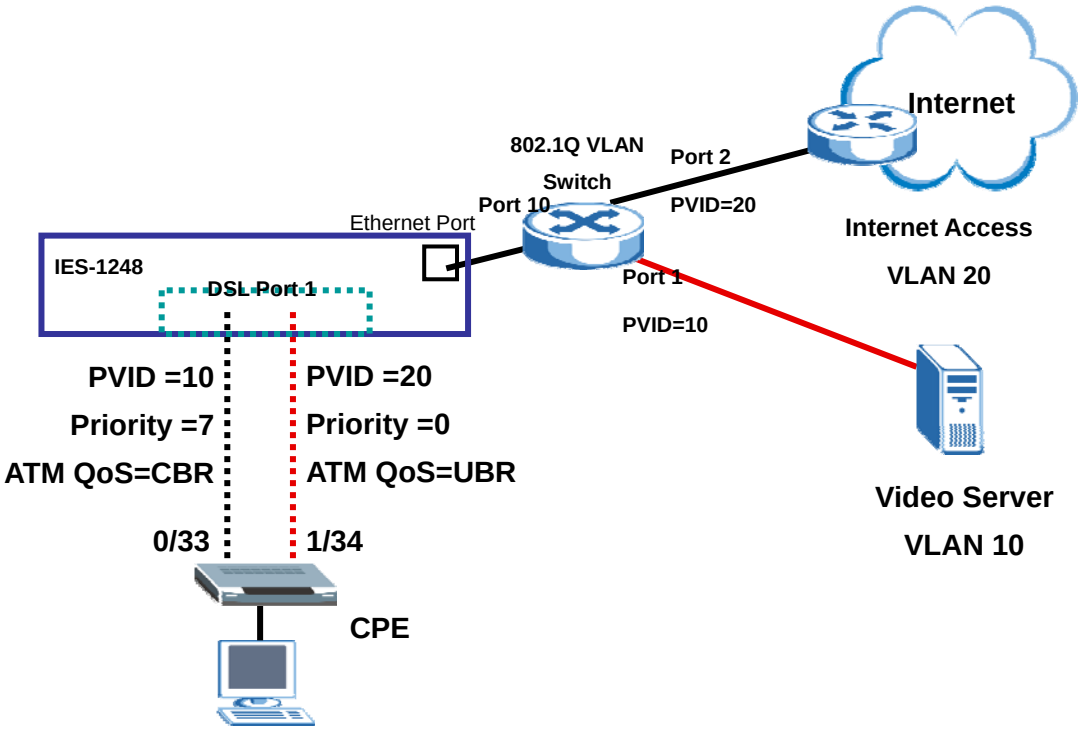
time data (such as audio and video).

In this application, we demonstrate how to set up the multiple PVCs environment. From the figure below, the PC wants to access the two kinds of network services. One is the Internet service (data service) and the other is Video service. Because we hope we can see the video smoothly, we need to set the video service higher priority. In IES-1248-51V, we can set the two services with different VLANs and assign the PVCs with different VLAN, priority and ATM QoS. That will make the video traffic get the higher priority than data traffic. We also can expand this application to triple play environment.



How to set up a Multiple PVCs environment.

Following procedures will introduce the settings of IES-1248-51V, VLAN-aware switch and ADSL CPE. We use ZyXEL ES-2024 and Prestige 660R-61 as VLAN-aware switch and ADSL CPE, respectively.

1. IES-1248-51V Settings

1.1 VLAN setup

We can set up VLAN like procedure described in VLAN application. Add VLAN10. Assign Port 1, ENET1 to be members of VLAN10 as show. We need to check the **Tx Tagging** on ENET1.

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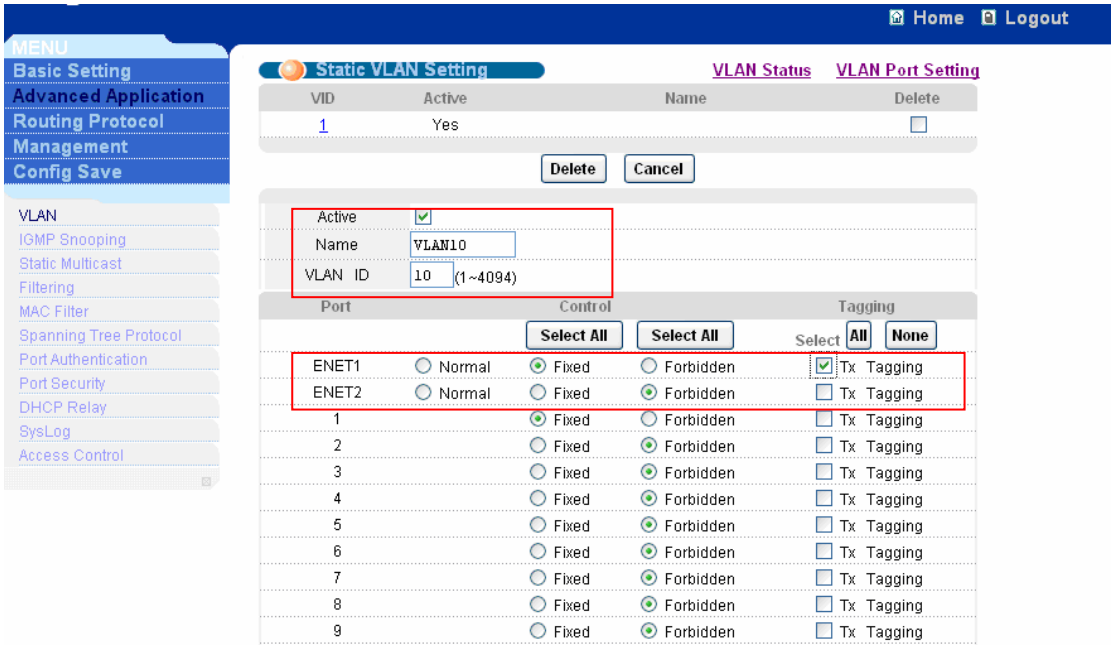
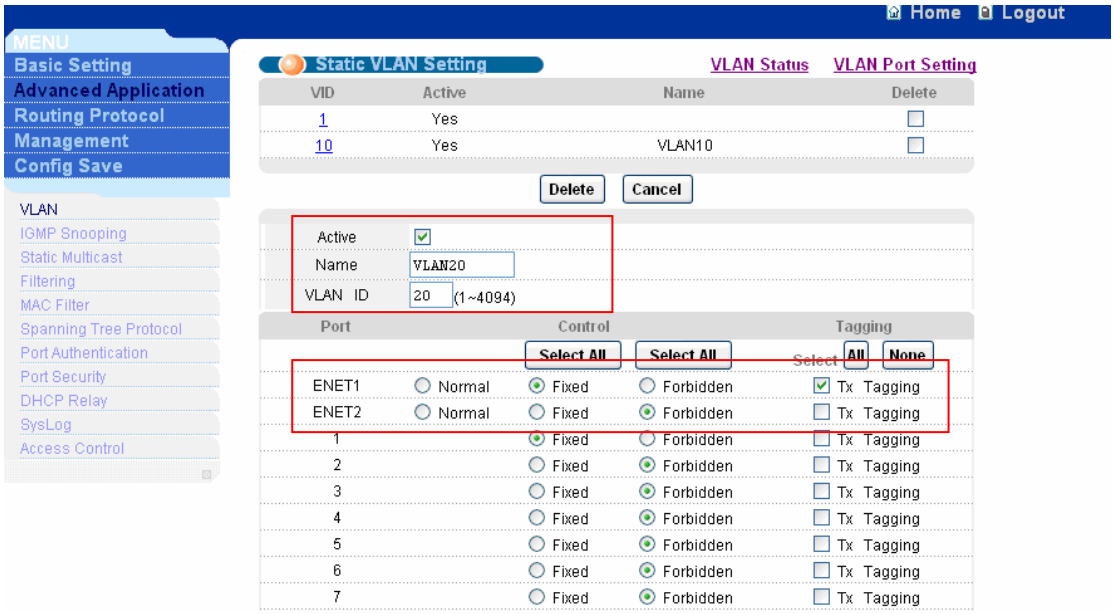


Add VLAN20. Assign Port 1, ENET1 to be members of VLAN20 as show. We need to check the **Tx Tagging** on ENET1.



1.2 VC profile setup

Click **Basic Setting** and **xDSL Profile Setup** in navigation panel to display the configuration screen as shown. Click VC profiles in this screen.

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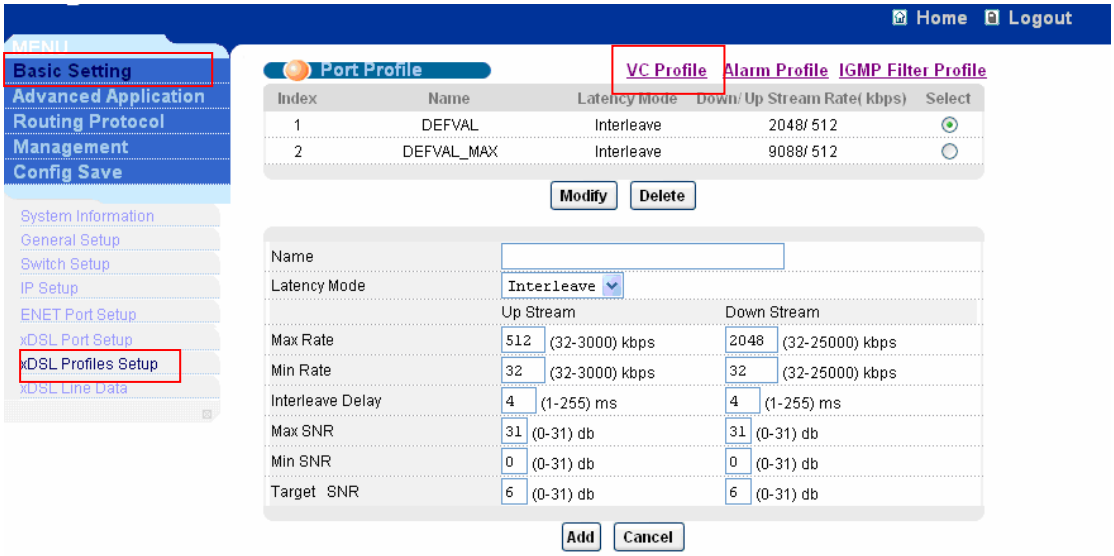
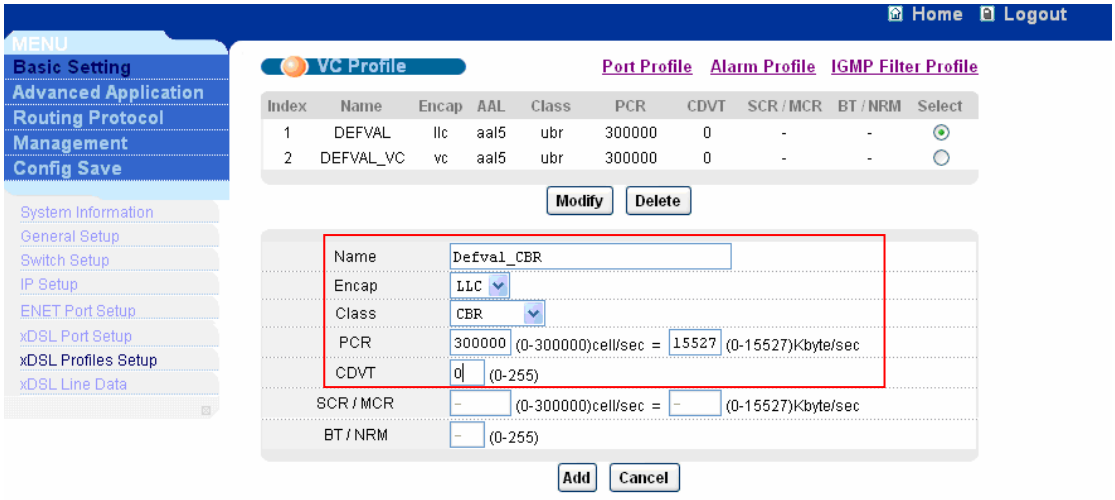


Add Defval_CBR VC profile. Set up Encap, Class, PCR and CDVT as shown. **Encap** should be LLC the same as IES-1248-51V. **Class** should be CBR which has higher priority in ATM QoS.



1.3 Multiple PVCs setup

Click **Basic Setting** and **xDSL Port Setup** in navigation panel to display the configuration screen as shown. Click **VC Setup** in this screen.

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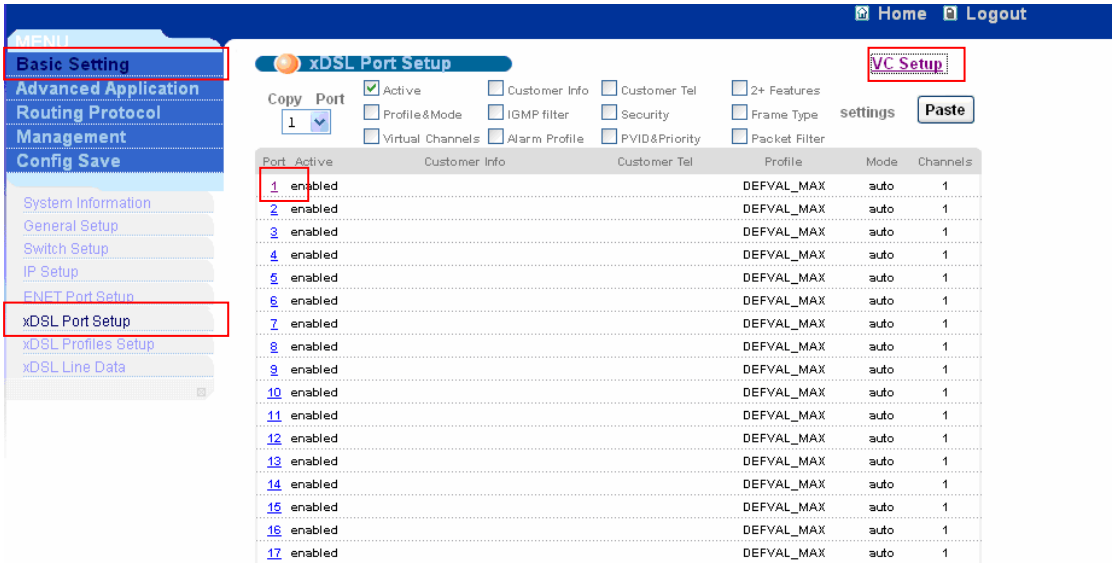
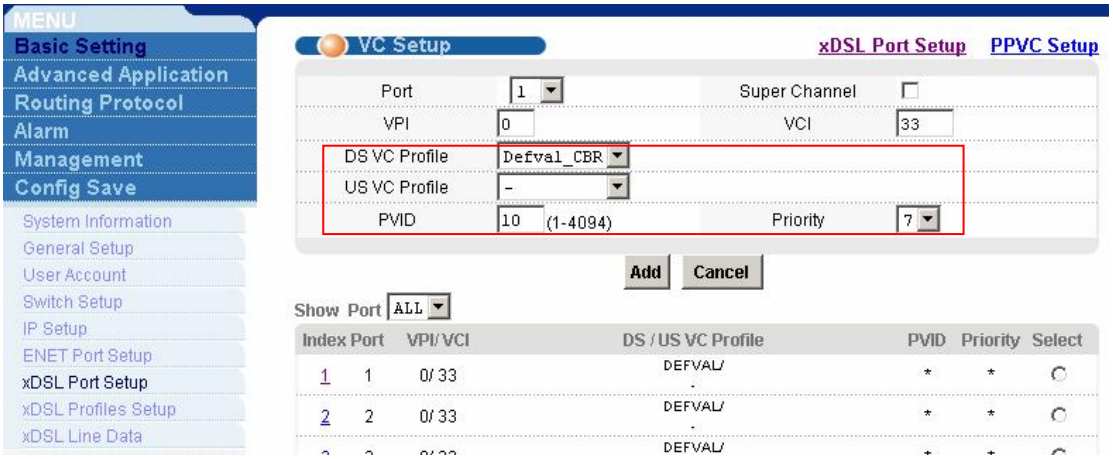
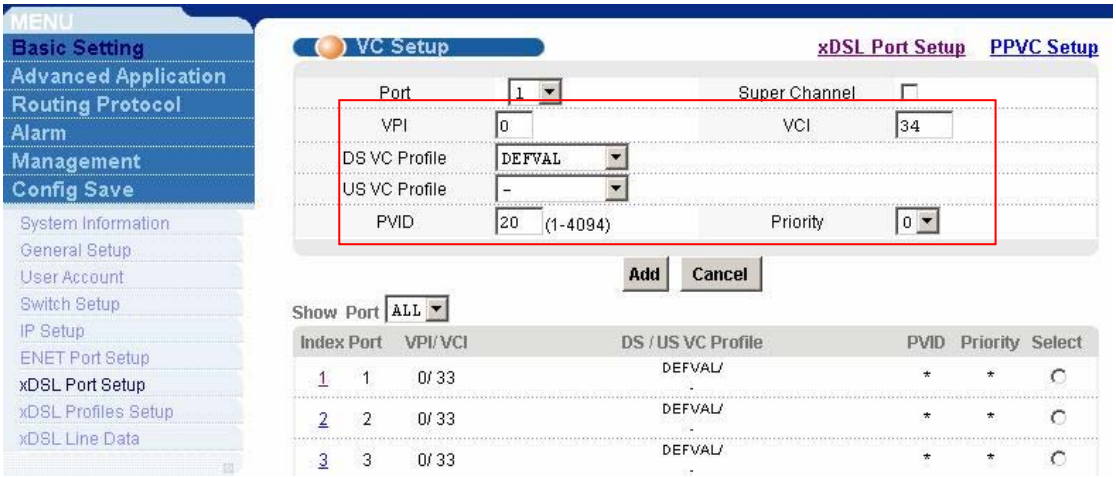


We hope VPI/VCI with 0/33 get the higher priority. We should modify this VPI/VCI with Defval_CBR profile which we created before. Press **Apply** button to make it take effect.



Then we add the VPI/VCI with 0/34. We apply the DEFVAL profile to this channel.



2. Prestige 660R-61 Settings

We need to set two channels. One is 0/33 and the other is 0/34. From former

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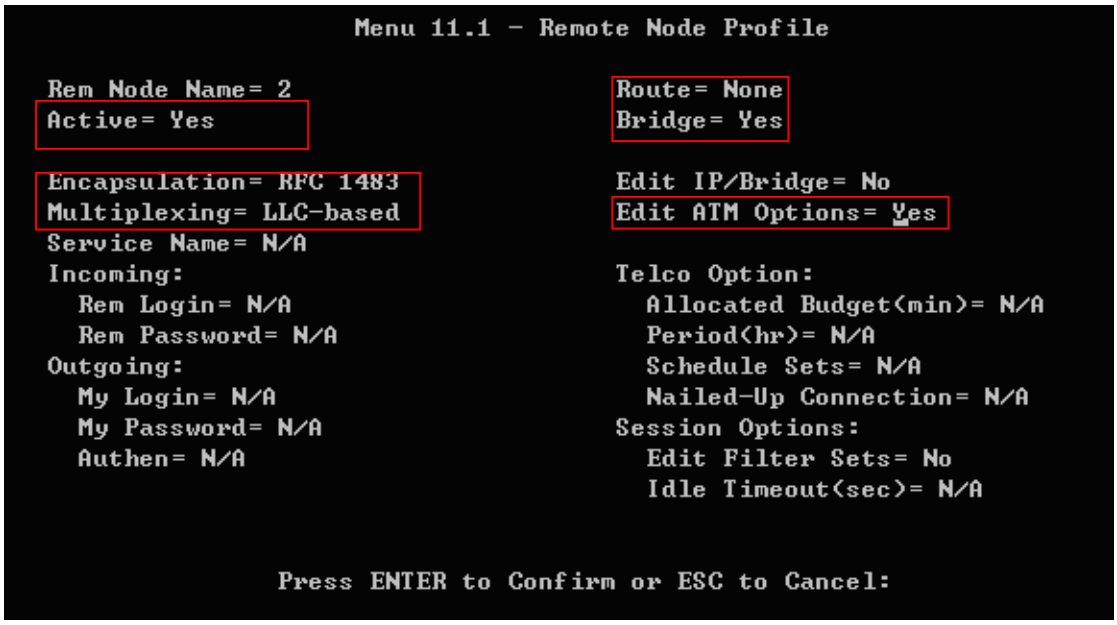
application, we already knew how to set up CPE with one channel (0/33). We just demonstrate how to set up second channel.

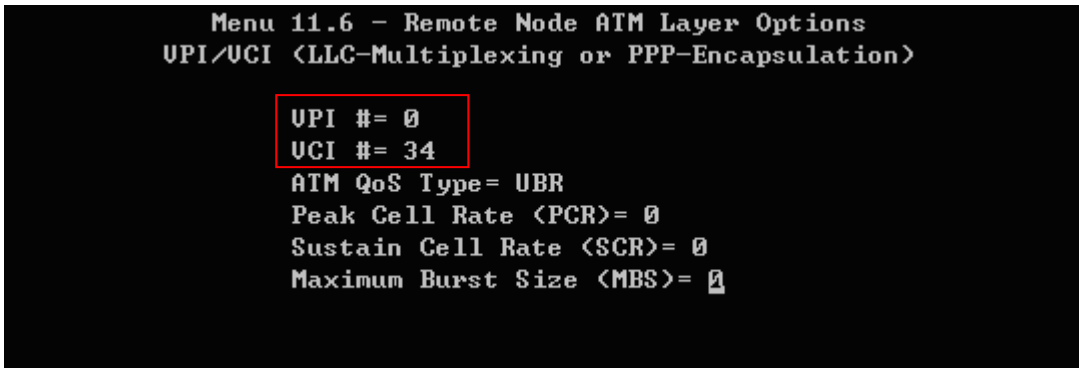
2.1 Menu11.1: Remote Node Profile

In menu11.1, we should activate this profile with “Active= Yes”. The Encapsulation and the Multiplexing are the same as the menu 4. Setting “Edit ATM Options=Yes” will enter Menu 11.6.



2.2 Menu11.6: Remote Node ATM Layer Options

We should set up another VPI/VCI with 0/34 the same as the IES-1248-51V.


Menu 11.6 - Remote Node ATM Layer Options
VPI/VCI (LLC-Multiplexing or PPP-Encapsulation)
VPI #= 0
VCI #= 34
ATM QoS Type= UBR
Peak Cell Rate (PCR)= 0
Sustain Cell Rate (SCR)= 0
Maximum Burst Size (MBS)= 0

3. ES-2024 settings

3.1 VALN

Click **Advanced Application** and **VLAN** in navigation panel to display configuration screen as shown. Click **Static VLAN** to show VLAN setup screen.

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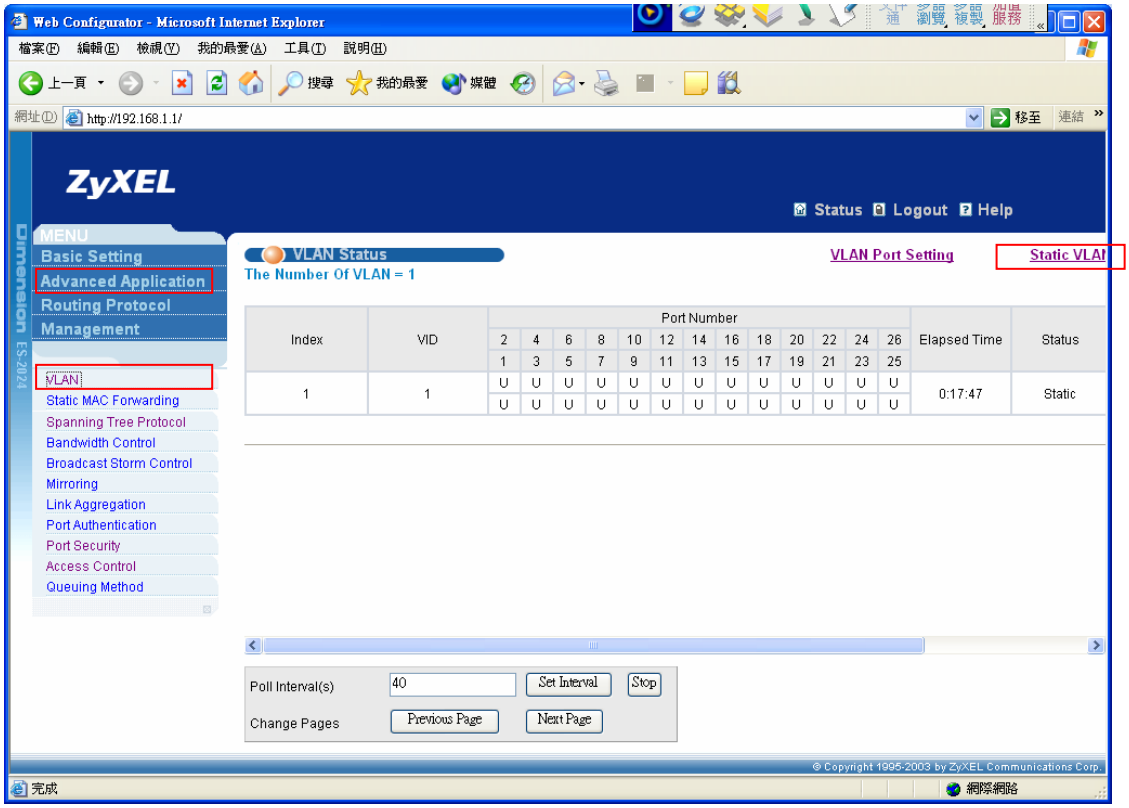
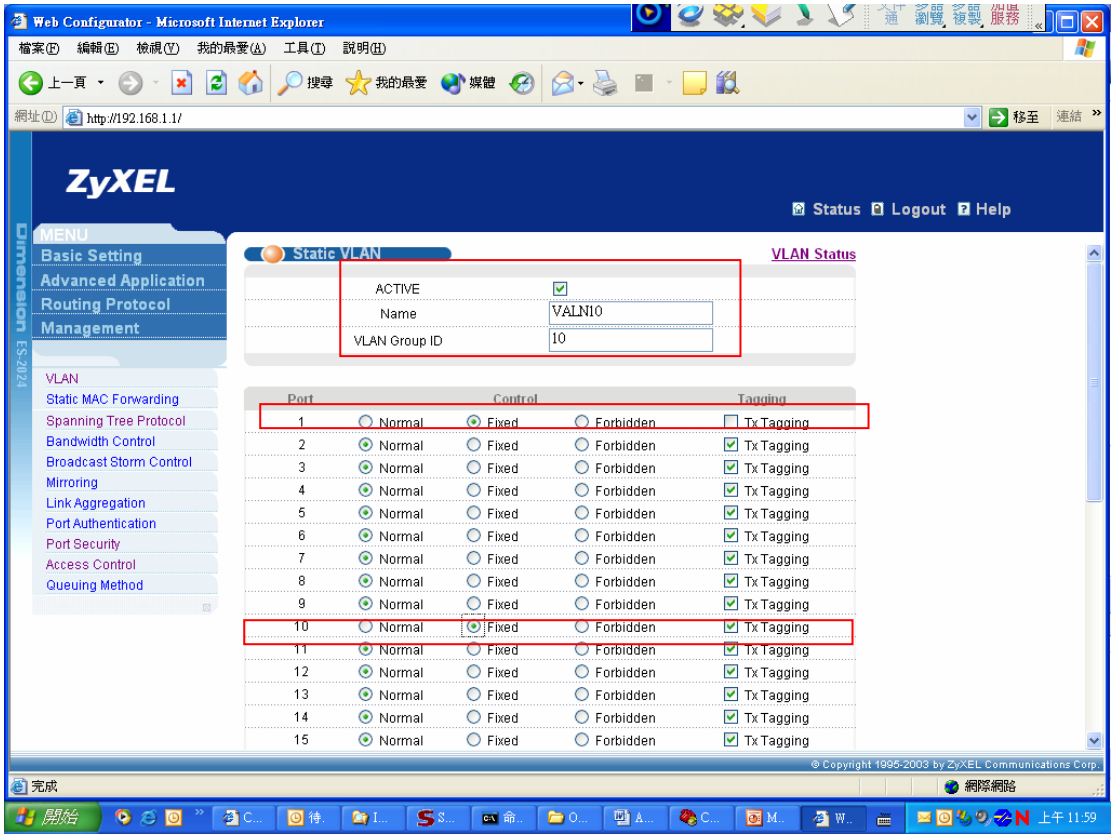


Add VLAN10. Assign Port 1, Port 10 to be members of VLAN10 as show. We need to check the **Tx Tagging** on Port 10.



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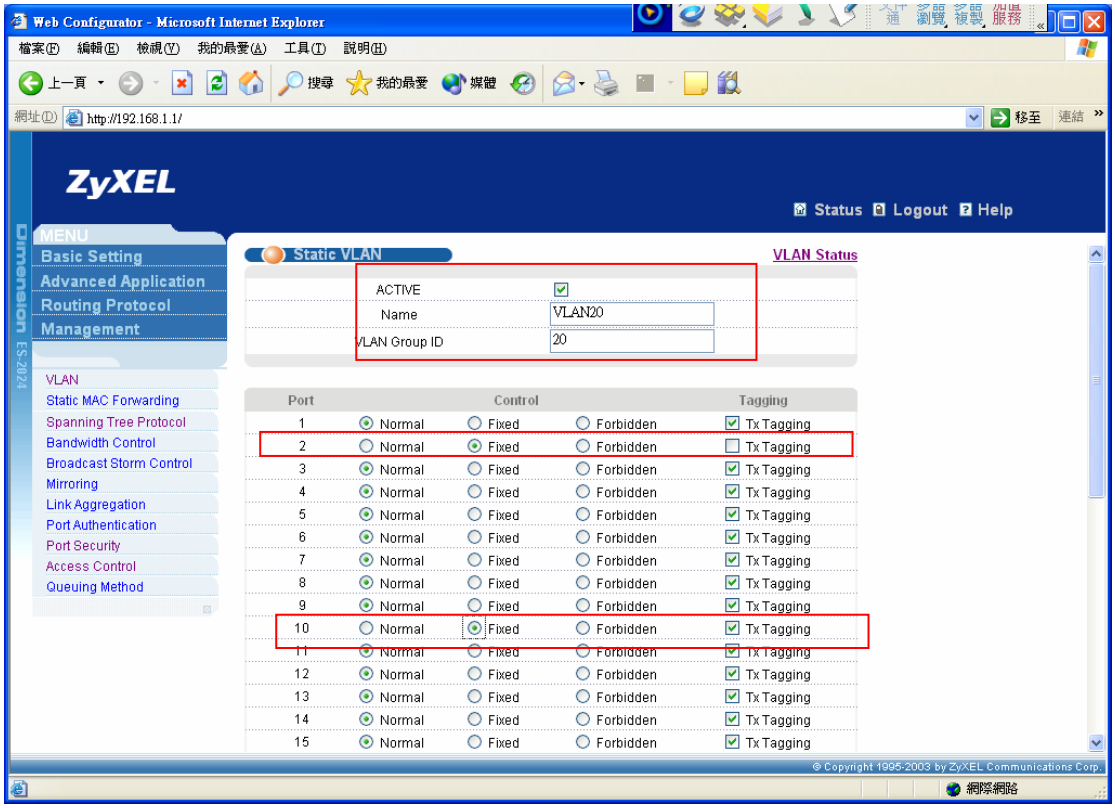
Add VLAN20. Assign Port 2, Port 10 to be members of VLAN20 as show. We need to check the **Tx Tagging** on Port 10.



3.2 PVID setup

Click **Advanced Application** and **VLAN** in navigation panel to display configuration screen as shown. Click **VLAN Port Setting** to show PVID setup screen.

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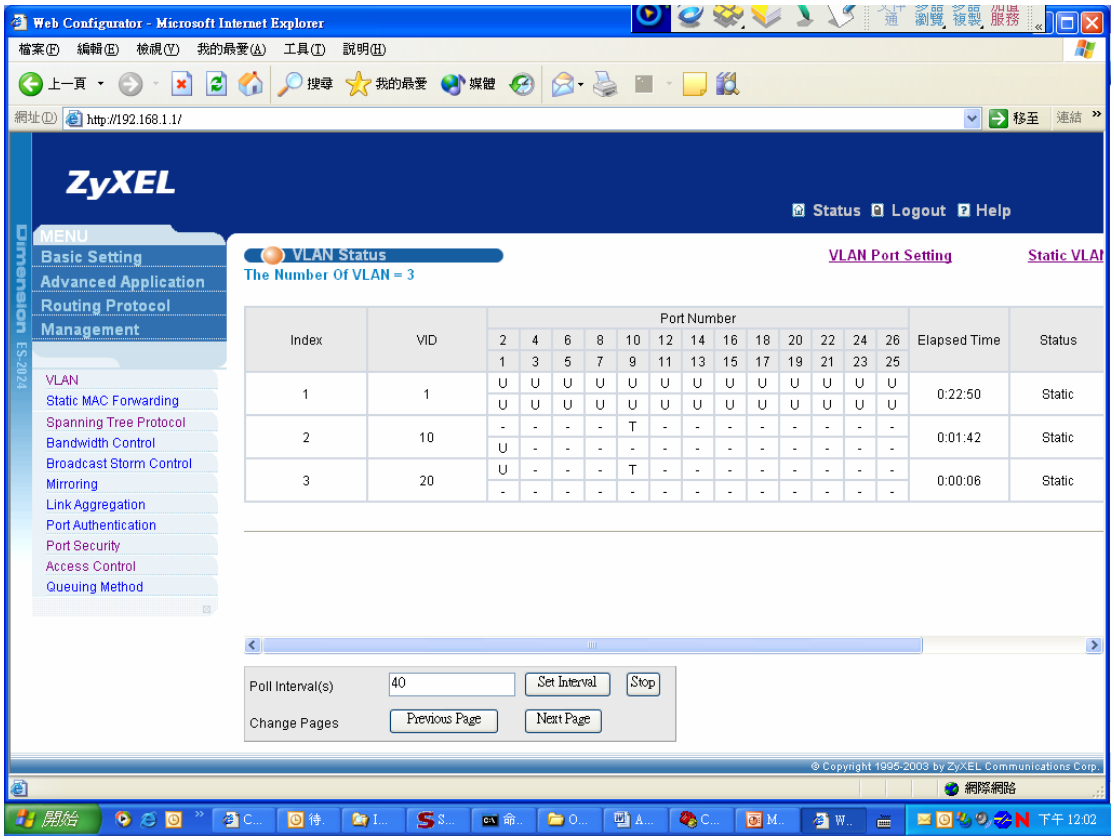
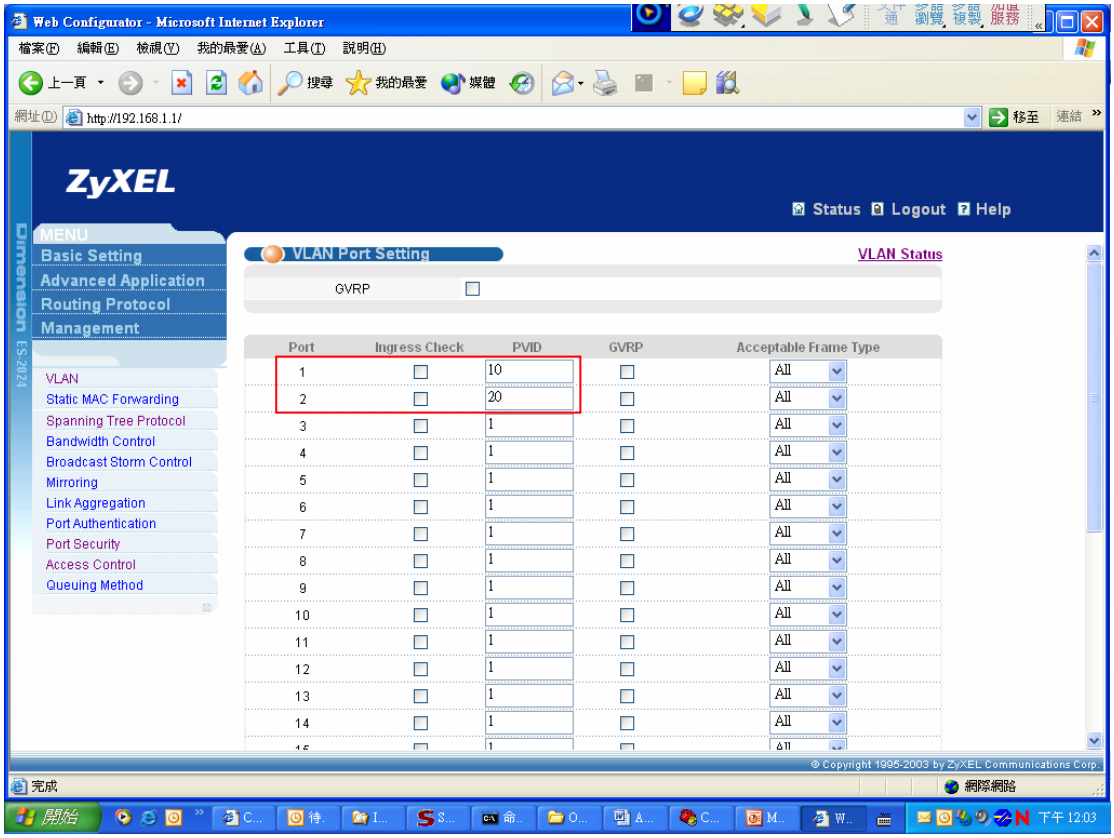


Let 10 be the PVID of Port 1 and 20 be the PVID of Port 2.



In this application, you will see the video traffic will go via 0/33 and data traffic

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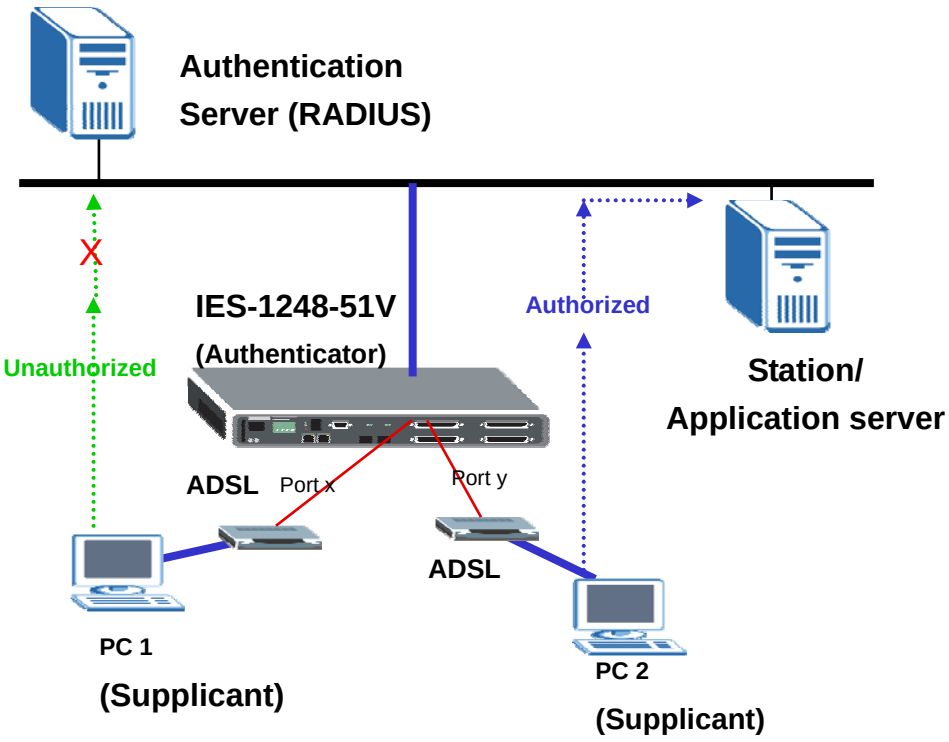
will go via 0/34. And the 0/33 get the higher priority. The video traffic will go first when the two traffics arrive at the same time.

802.1x Application

IEEE 802.1x port-based authentication is desired to prevent unauthorized ports (clients) from gaining access to the network. It is an extended authentication protocol that allows support of RADIUS (Remote Authentication Dial in User Service, RFC2138, 2139) for centralized user profile management on a network RADIUS server.

We want to deploy 802.1x environment in this application. The following figure shows the 802.1x example. PC1(supplicant) and PC2(supplicant) want to access to the application server. If PC1 is not unauthorized, the traffic from PC1 to application server will be blocked. If PC2 is an authorized client, then it can access to the application server. From the figure, IES-1248-51V acts as an authenticator.



How to set up an 802.1x environment.

We should configure Authenticator, RADIUS and Supplicant three parts in 802.1x

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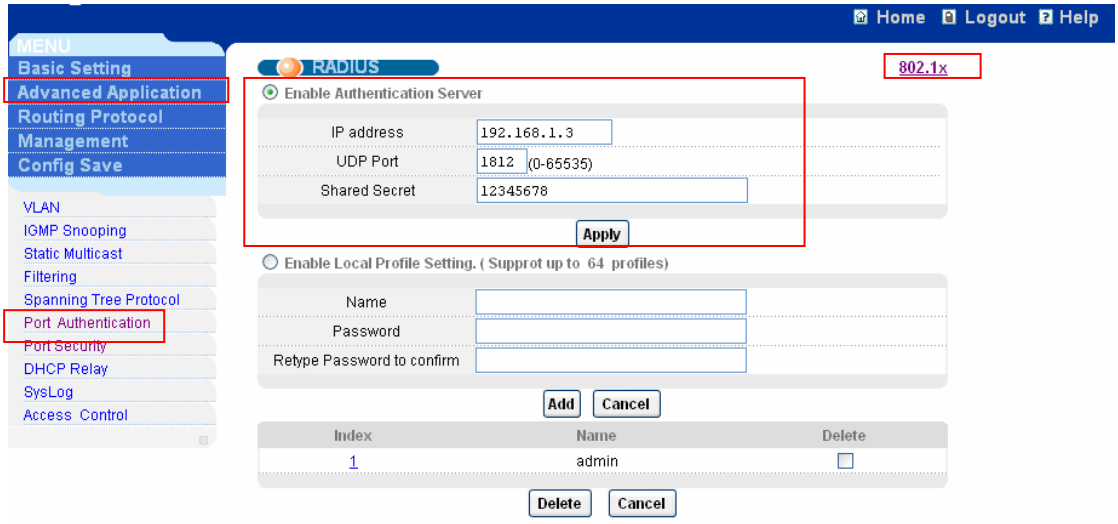
environment. The Microsoft 802.1x client and ZyXEL Vantage 50 will be used as supplication and RADIUS, respectively. Following sections will describe the detailed procedure to set up the environment.

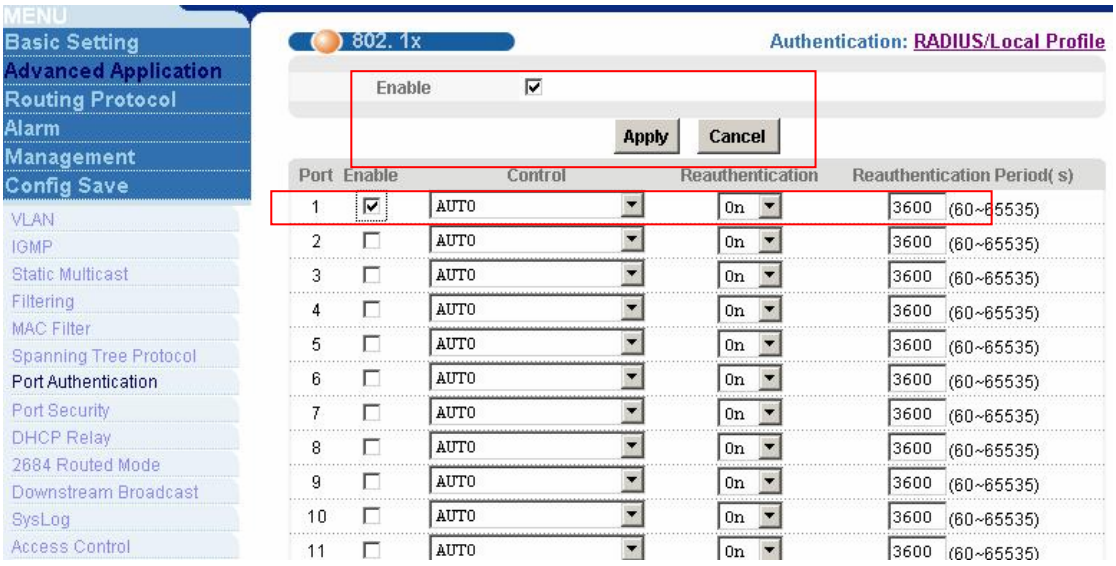
1. IES-1248-51V (Authenticator) settings:

1.1 RADIUS settings:

Click **Advanced Application**, **Port Authentication** in the navigation panel to display configuration screen as shown. Click **Enable Authentication Server** and set the RADIUS server **IP address**, **UDP port** and **shared Secret,** which is the same as Radius server. Then click **Apply** to make the settings take effect.



Click the **802.1x** link to enter the 802.1x settings. Check the **Enable Authentication** and click **Apply** button to enable 802.1x authentication. Check **Enable** to turn on 802.1x authentication on that port. You can leave other settings as default values. Click **Apply** to save your changes.



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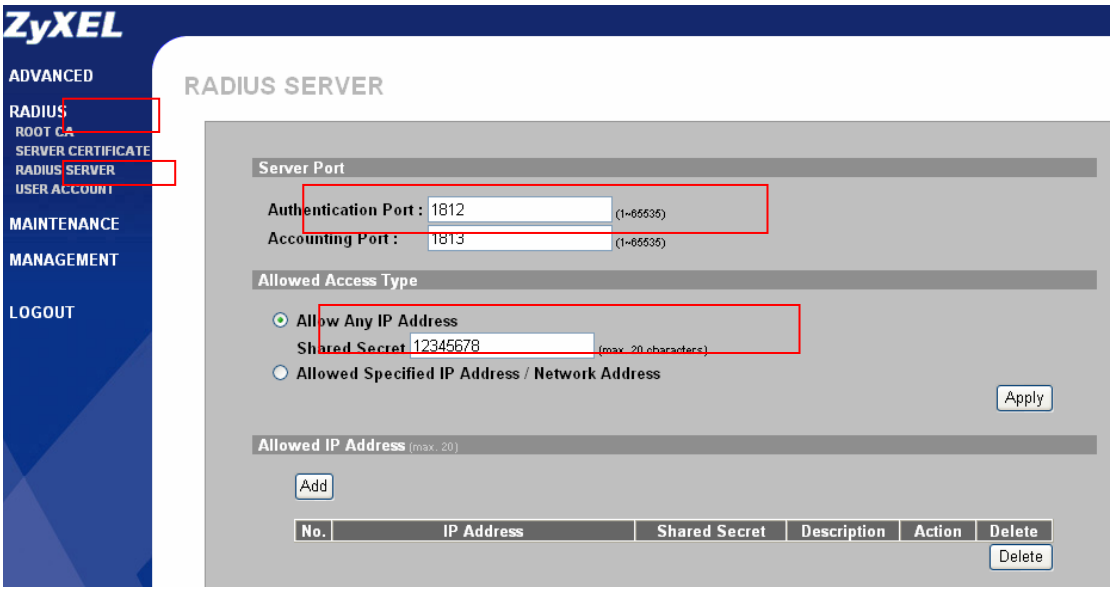
2. Vantage 50(RADIUS) settings:

We use Vantage 50 as the RADIUS server. It's a one of ZyXEL's product. Of course, you can use other RADIUS server like Funk Steel-Belted RADIUS, Cisco Access Control Server, MeetingHouse Aegis server and so on. You can configure it by WEB GUI and its default IP is 192.168.1.3.

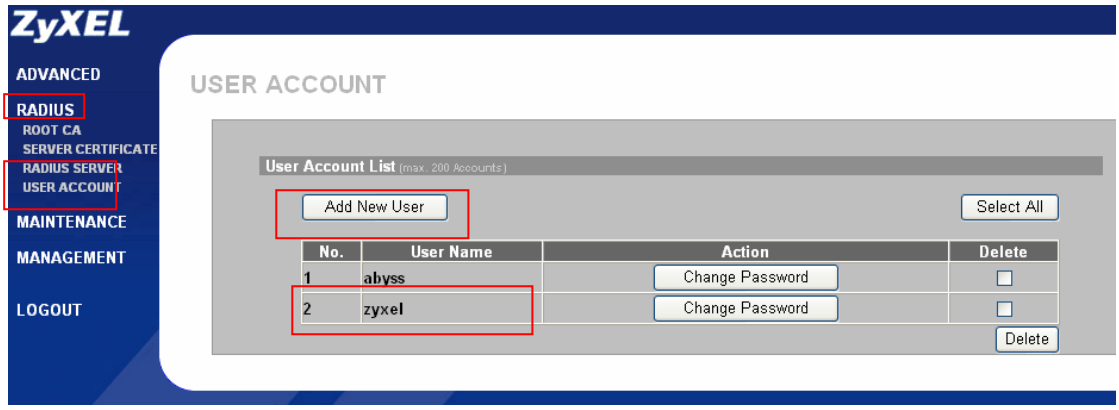
2.1 RADIUS server setup

Click **RADIUS**, **RADIUS SERVER** in the navigation panel to display configuration screen as shown. You can use the default values or change the **Authentication port**, **Shared Secret**. Remember these values MUST be the as the settings of client.



2.2 Create User Account

Click **RADIUS**, **USER ACCOUNT** in the navigation panel to display configuration screen as shown. You can use the existed user account or create the new one by clicking **Add New User** button. Remember the client site MUST use the account in RADIUS server.



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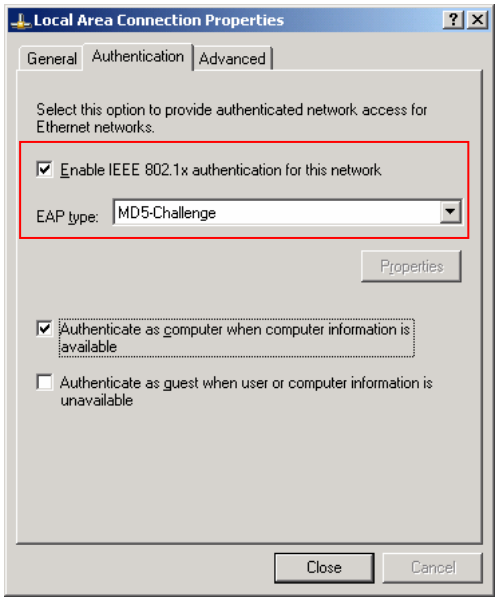
3. Windows XP(Supplicant) settings:

There are many supplicants we can choose like MeetingHouse Aegis client, Funk Odyssey client and Microsoft 802.1x client. We take Microsoft 802.1x client as an example here.

3.1 802.1x/MD5-challenge setup

Open the **Local Area connection Properties**, and then click **Authentication** page. Check the **Enable IEEE 802.1x authentication for this network** and select the **MD5-challenge** in EAP type combobox. Please see the following figure.



When the 802.1x starts, it will prompt you to enter the user name and password. Please see the following figure.

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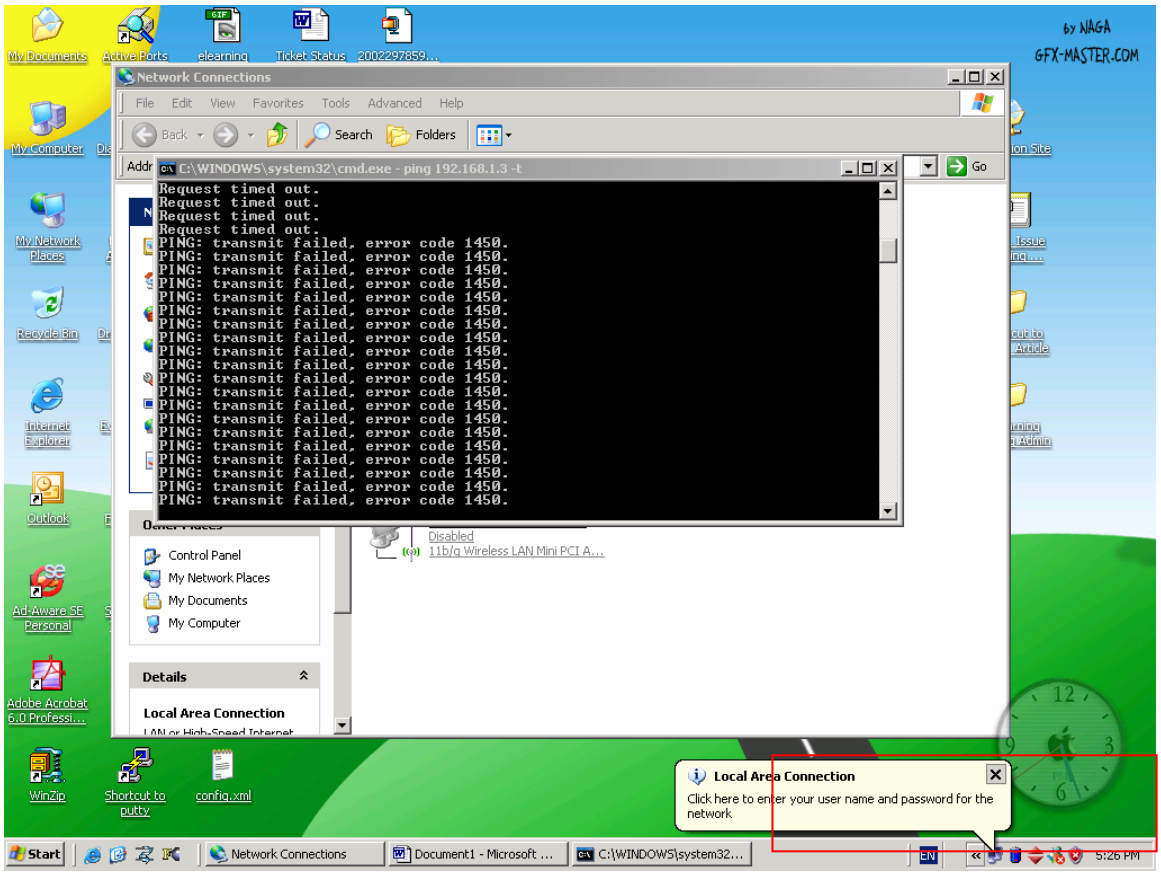
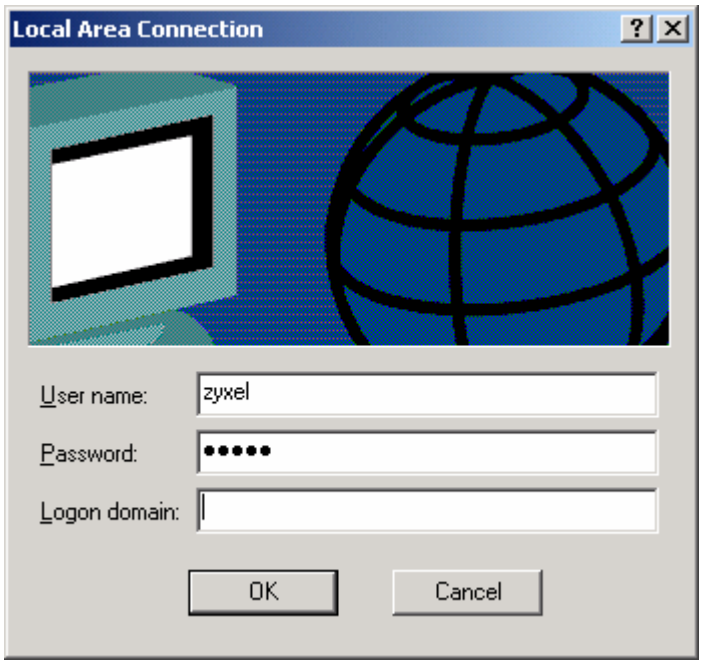


After click the icon, there will be a dialog for entering the user name and password. Click ok after input the correct user name and password that are in the database of authentication server. The settings of client site are finished.



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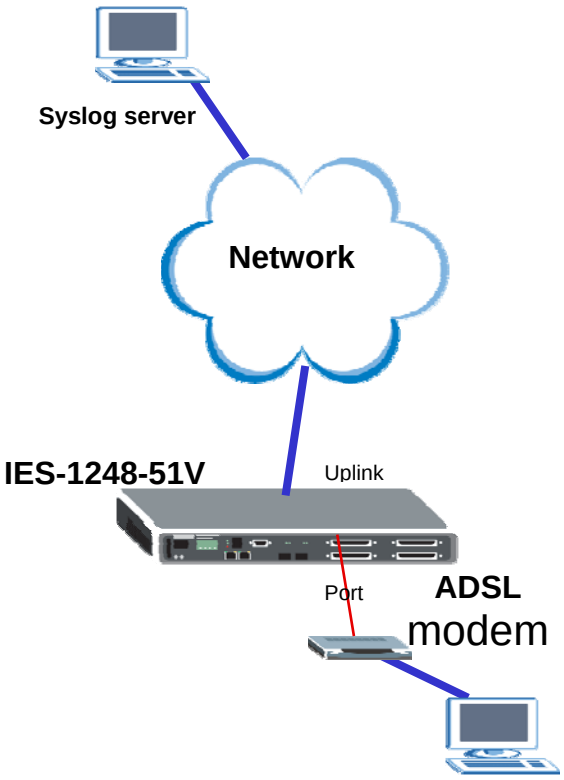
After above procedure, we can allow the authenticated port the access the server. If the DSL port doesn't be authenticated, the PCs behind the port can't access the network.

4. Prestige 660R-61 Settings

Please refer to the procedures in previous application.

Setting up the Syslog Server

ZyXEL products are able to send system log to a Syslog deamon such as Unix Syslogd and Kiwi's Syslog Daemon (http://www.kiwisyslog.com/). When DSL or Ethernet ports are linked up/down, IES-1248-51V sends a record to Syslog server. The Syslog server can be placed on the network, which IES-1248-51V can access.



How to set up a Syslog server.

We should configure IES-1248-51V and Syslog server in this application. Here, we use the Kiwi's Syslog Daemon as an example. Following sections will describe the detailed procedures to set up the environment.

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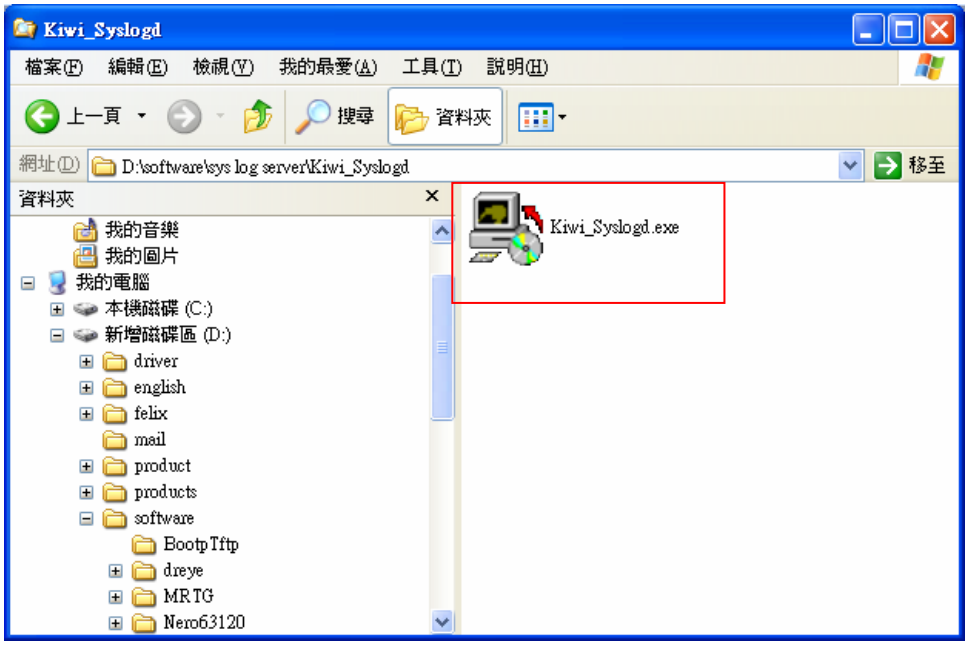
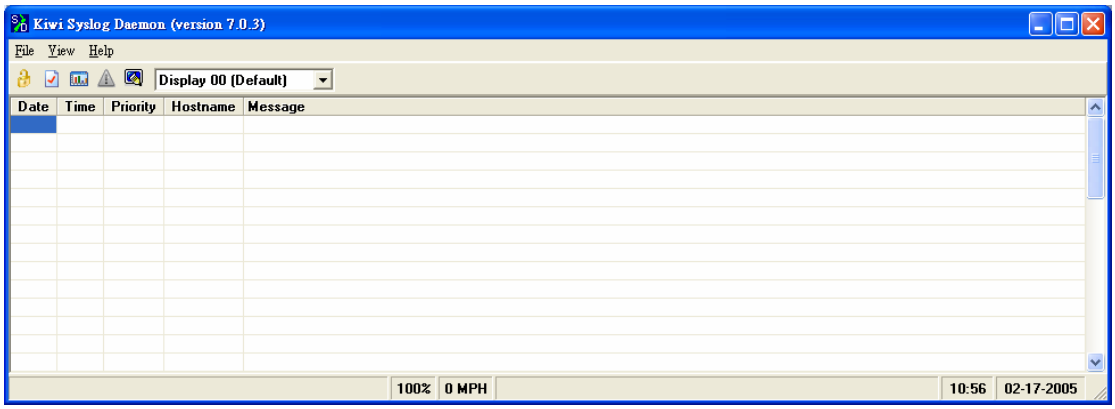
1. Install and Run Kiwi's Syslog Server

Double Click the Kiwi's Syslog Server installing program. It is very easy to install it.



After finishing the installation, you can run it from the Start Menu. And you will see following dialog. And the Server's IP is 192.168.1.77.



2. IES-1248-51V settings

Click **Advanced Application**, **SysLog** in the navigation panel to display configuration screen as shown. Check the **Enable UNIX Syslog**. Assign the UNIX Syslog Server IP, 192.168.1.77 in this case. Then press the **Apply** button and the setup is complete.

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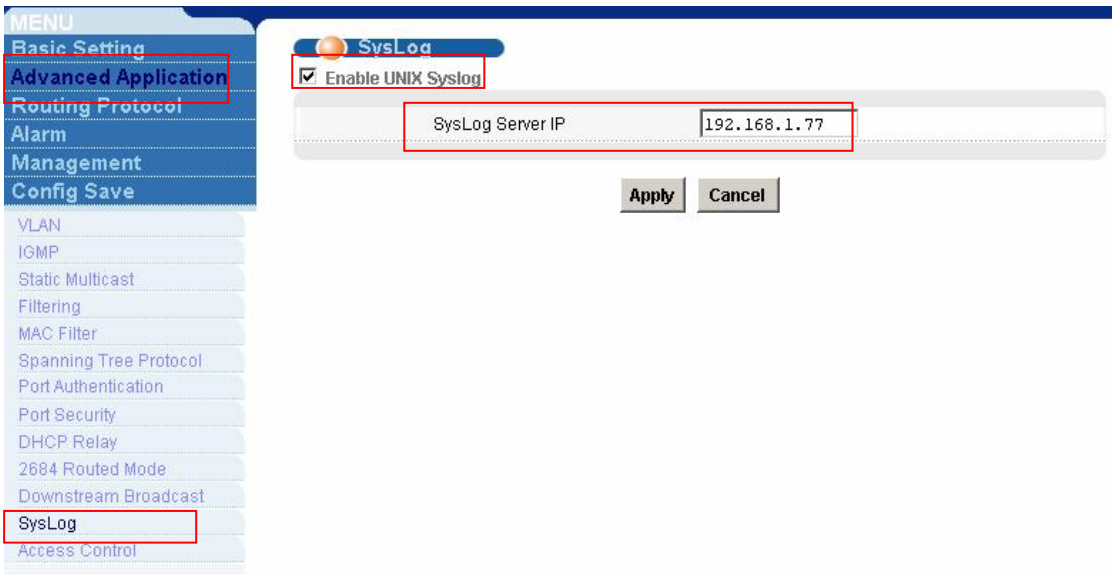
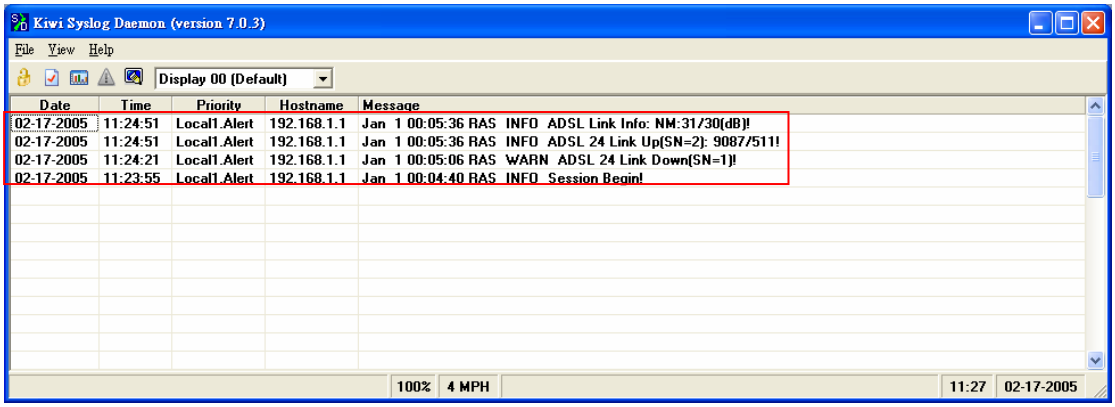


When DSL ports are linked up/down, IES-1248-51V sends a record to Syslog server. We can see these logs in Kiwi's Syslog server.


Kiwi Syslog Daemon (version 7.0.3)
File View Help
Display 00 (Default)
Date Time Priority Hostname Message
02-17-2005 11:24:51 Local1.Alert 192.168.1.1 Jan 1 00:05:36 RAS INFO ADSL Link Info: NM:31/30(dB)!
02-17-2005 11:24:51 Local1.Alert 192.168.1.1 Jan 1 00:05:36 RAS INFO ADSL 24 Link Up(SN=2): 9087/511!
02-17-2005 11:24:21 Local1.Alert 192.168.1.1 Jan 1 00:05:06 RAS WARN ADSL 24 Link Down(SN=1)!
02-17-2005 11:23:55 Local1.Alert 192.168.1.1 Jan 1 00:04:40 RAS INFO Session Begin!
100% 4 MPH 11:27 02-17-2005

Setting up the Ring Environment

The Ring topology is used to guarantee the network being normal even if one link between two device broken. So, in ring topology, the network will work well if one link is broken. In Ring Topology, you must enable RSTP/STP to prevent the loop issue.

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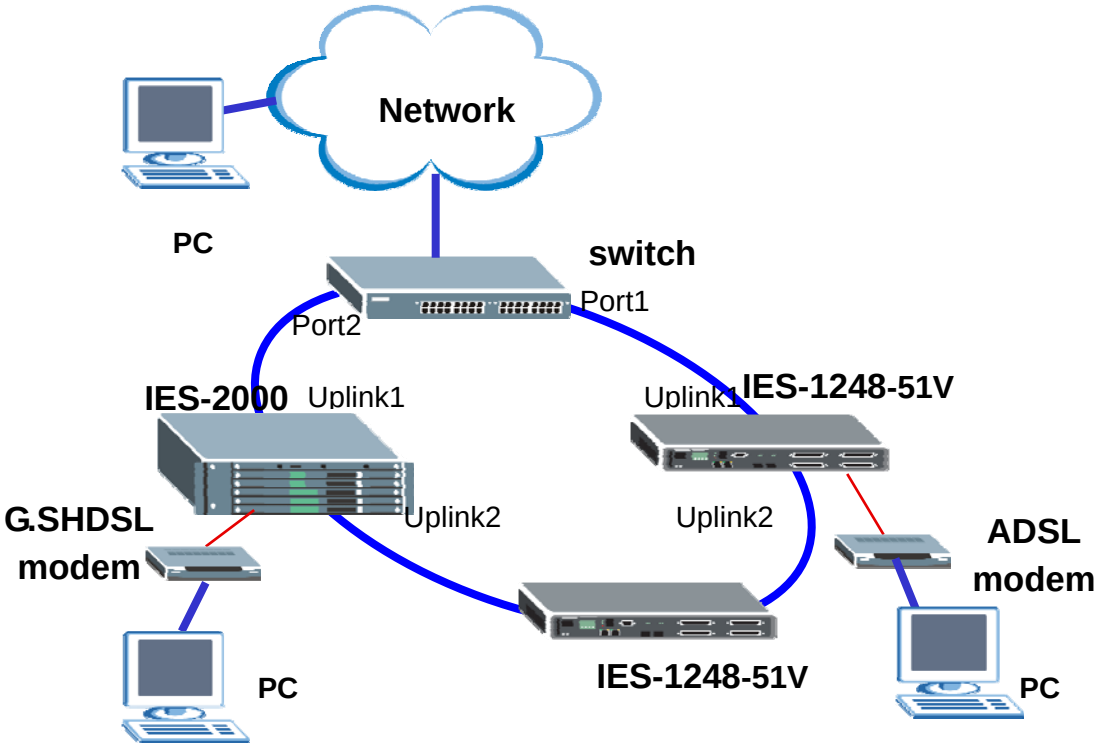

How to set up a Ring Environment.

We set up Ring environment with one IES-1248-51V, one IES-2000 and one ES-4024. A PC behind IES can connect the PC in the network even one of the links broken. Following sections will describe the detailed procedures to set up the environment.

1. IES-1248-51V settings

1.1 Enable Spanning Tree protocol on Ethernet ports

Click **Advanced Application**, **Spanning Tree Protocol** in the navigation panel to display configuration screen as shown. You will see the **Spanning Tree Protocol Status** page. Click **STP config** to configure panning tree protocol settings.

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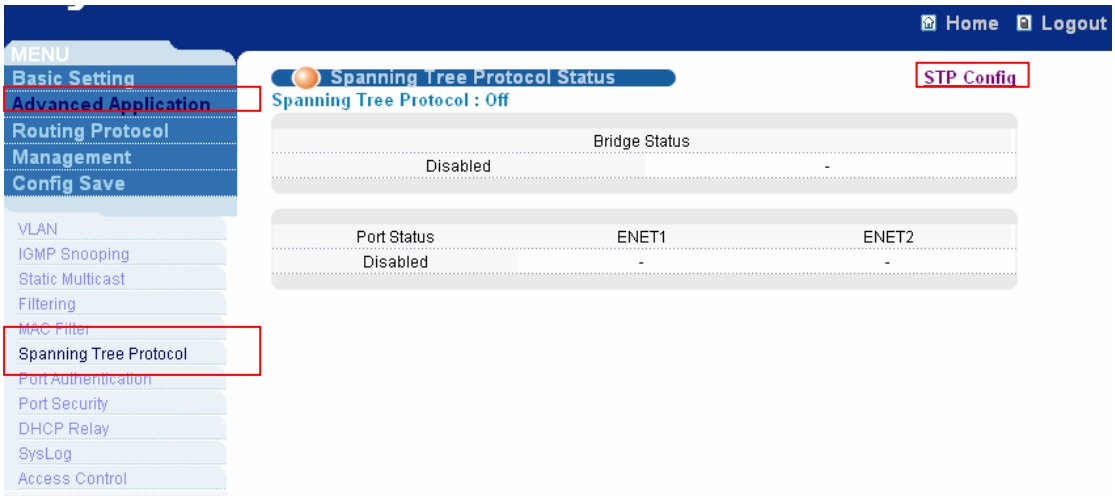
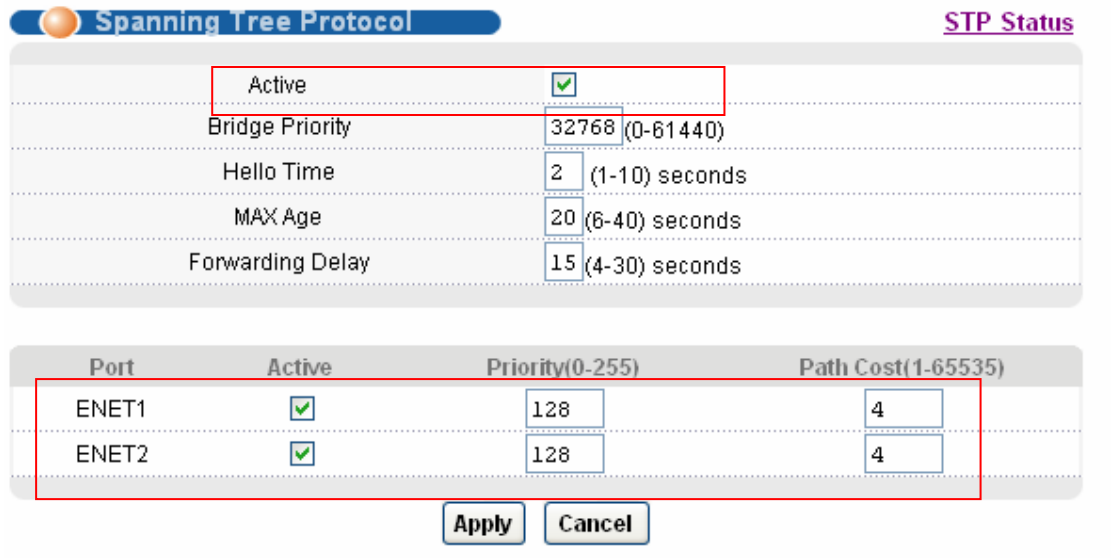


Click **Active** to enable Spanning Tree Protocol. Then enable it on **ENET1** port and **ENET2** port.



2. Setup IES-2000

2.1 Enable Spanning Tree protocol

Click **Switch Setup** in the navigation panel to display configuration screen as shown. Then check **Spanning Tree Protocol** to enable it.

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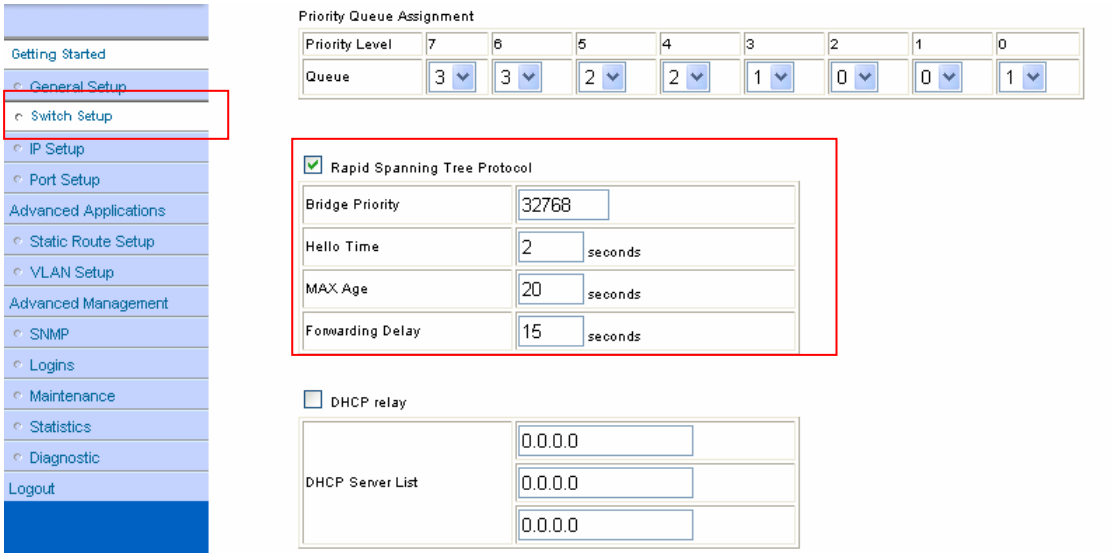
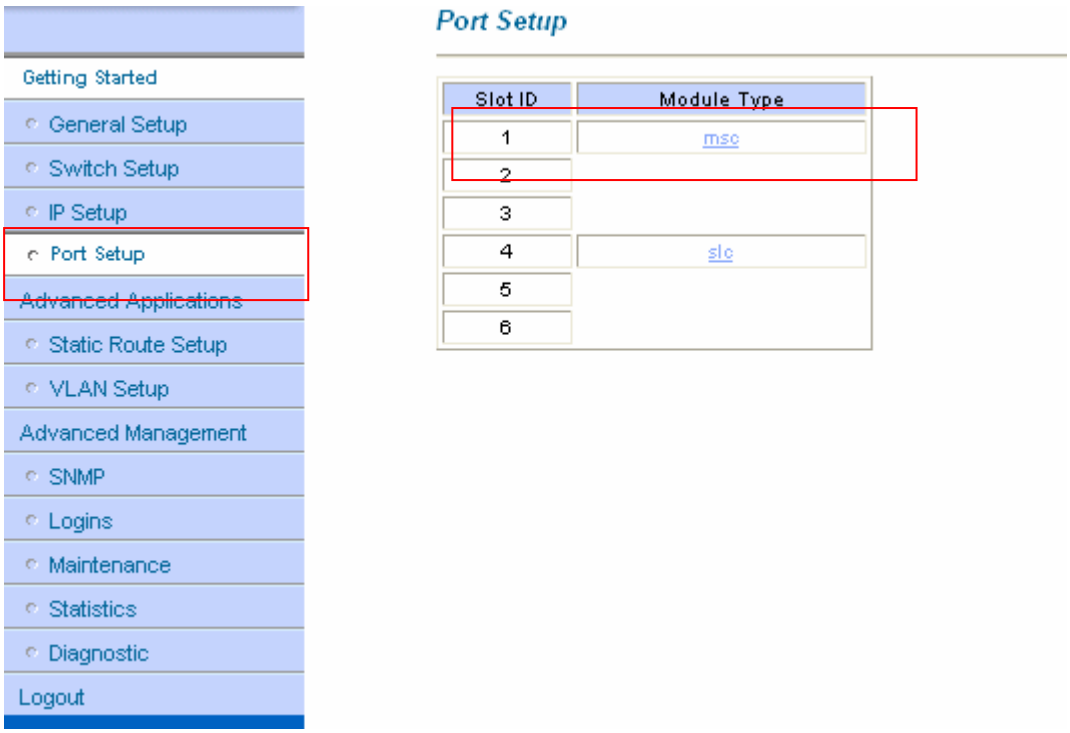


2.2 Enable Spanning Tree protocol on Ethernet ports

Click **Port Setup** in the navigation panel to display configuration screen as shown.

Click **msc** to display MSC card Port setup.



Click **Uplink2** to set up this port.

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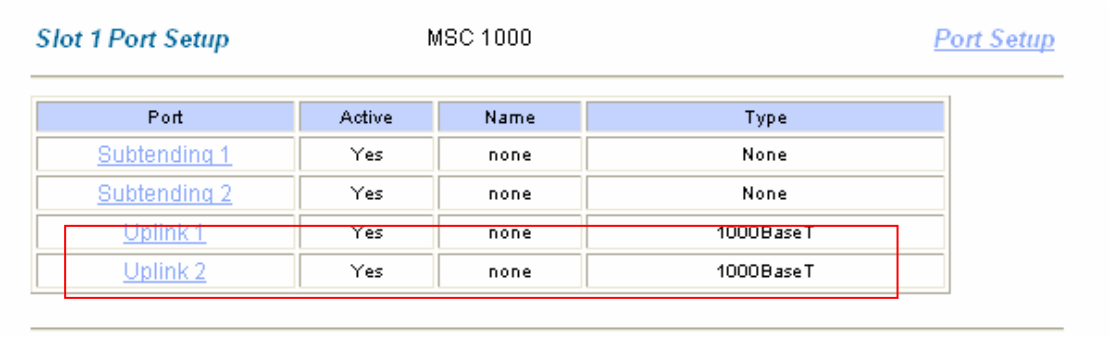
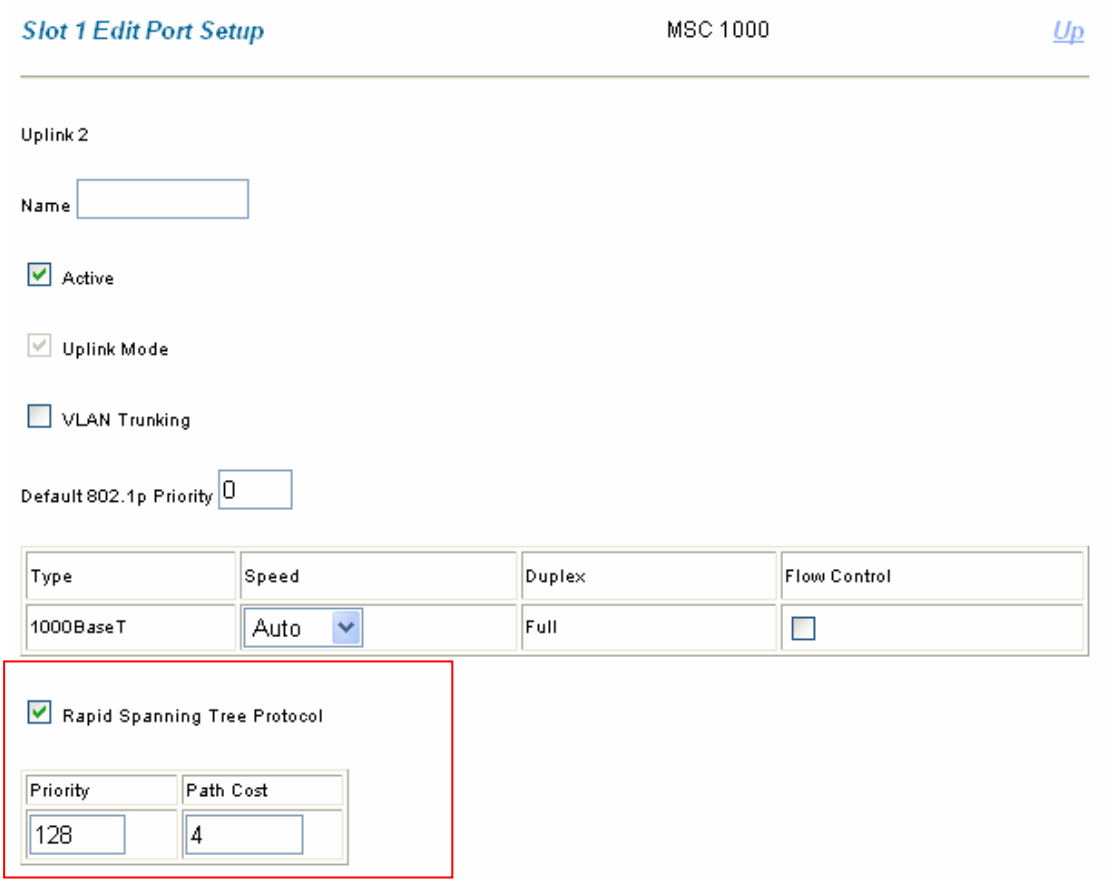


Check **Spanning Tree Protocol** to enable it.



Take the same procedures with Uplink1. Please see the following figure.

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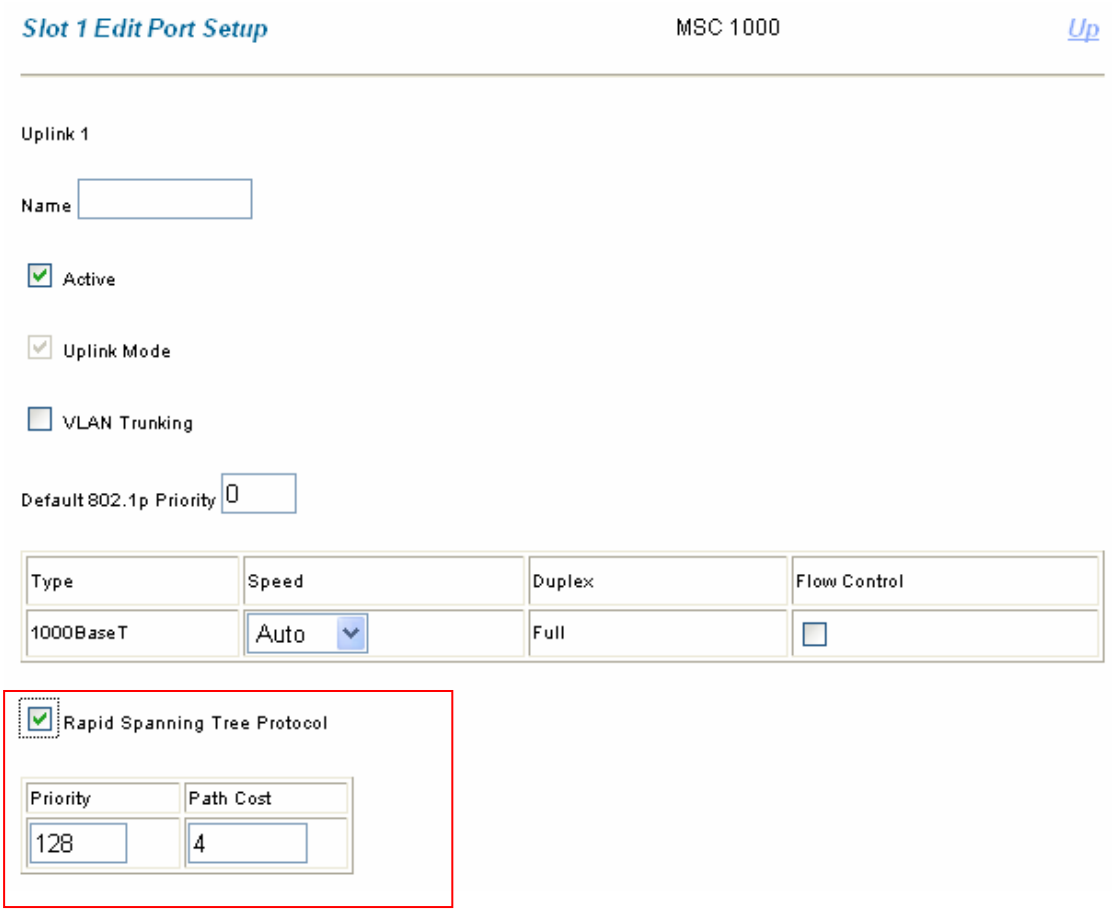
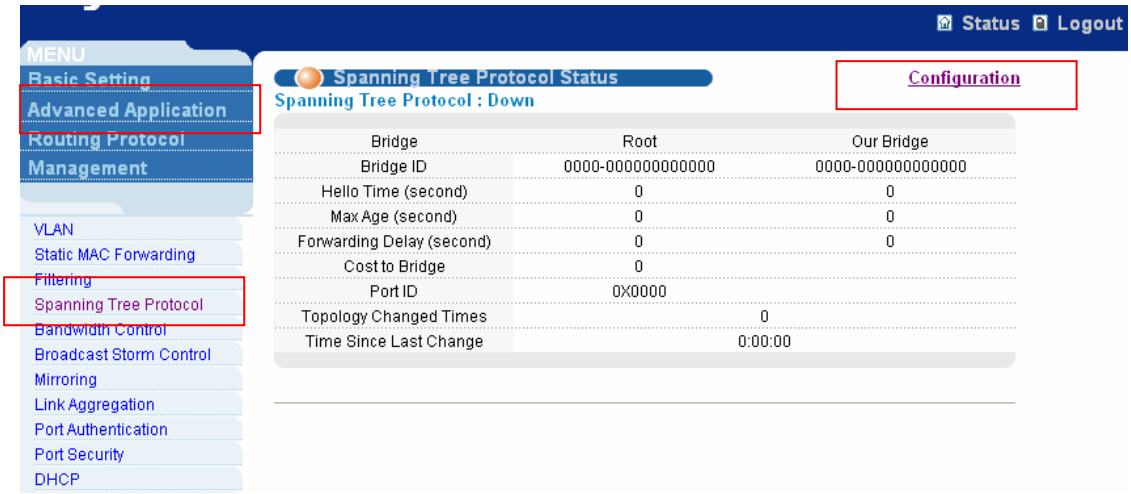


3. Setup ES4024

3.1 Enable Spanning Tree protocol on Ethernet ports

Click **Advanced Application**, **Spanning Tree Protocol** in the navigation panel to display configuration screen as shown. You will see the **Spanning Tree Protocol Status** page. Click **Configuration** to configure panning tree protocol settings.



Click **Active** to enable Spanning Tree Protocol. Then enable it on **Port 1** and **Port 2**.

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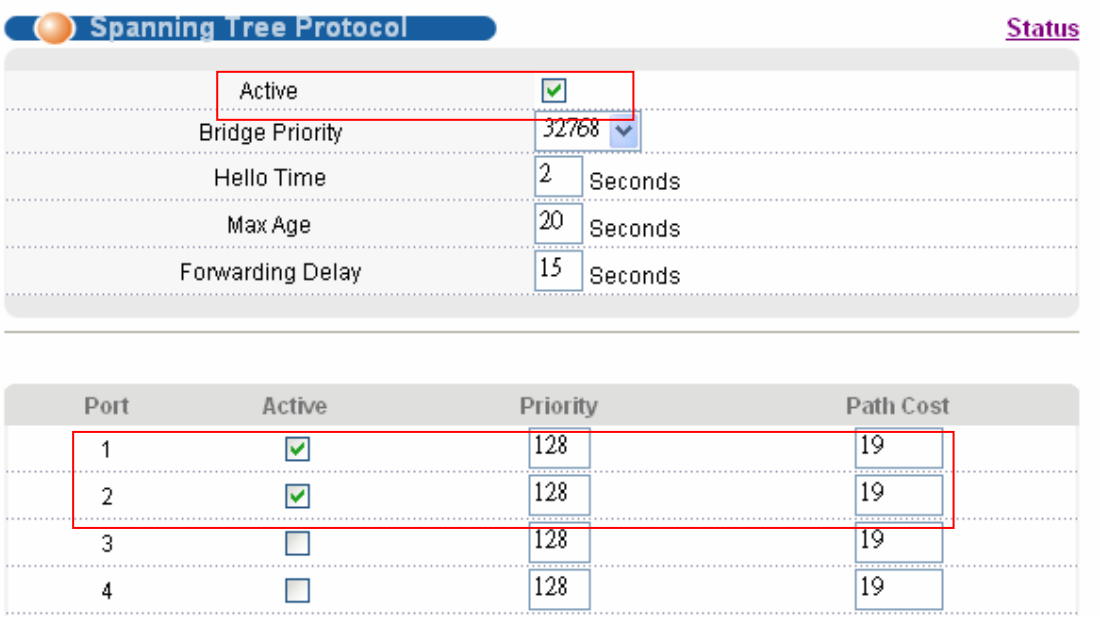
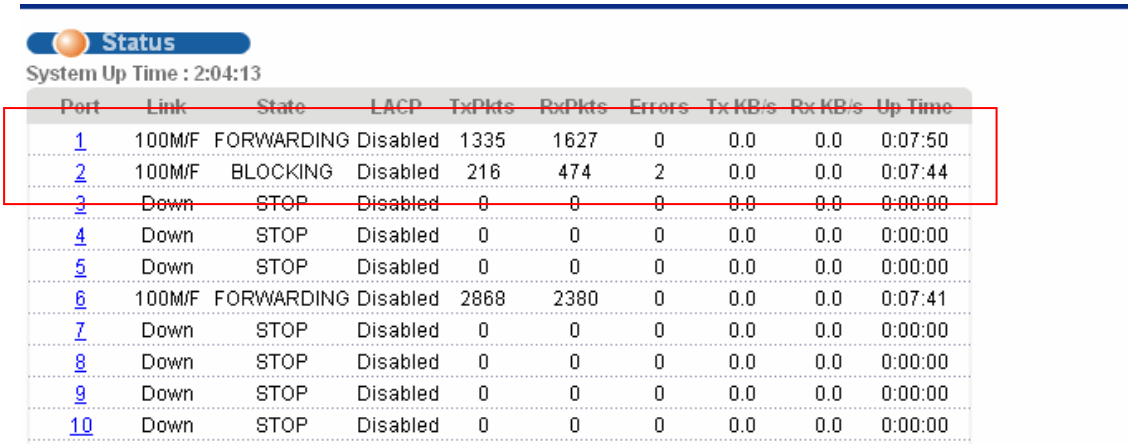


4. Results

We can see the link between port 2 of ES4024 and Uplink1 of IES2000 will be blocked as shown after we connect.


Status
System Up Time : 2:04:13
Port Link State LACP TxPkts RxPkts Errors Tx KB/s Rx KB/s Up Time
1 100M/F FORWARDING Disabled 1335 1627 0 0.0 0.0 0:07:50
2 100M/F BLOCKING Disabled 216 474 2 0.0 0.0 0:07:44
3 Down STOP Disabled 0 0 0 0.0 0.0 0:00:00
4 Down STOP Disabled 0 0 0 0.0 0.0 0:00:00
5 Down STOP Disabled 0 0 0 0.0 0.0 0:00:00
6 100M/F FORWARDING Disabled 2868 2380 0 0.0 0.0 0:07:41
7 Down STOP Disabled 0 0 0 0.0 0.0 0:00:00
8 Down STOP Disabled 0 0 0 0.0 0.0 0:00:00
9 Down STOP Disabled 0 0 0 0.0 0.0 0:00:00
10 Down STOP Disabled 0 0 0 0.0 0.0 0:00:00

After we remove the cable between port 1 of IES-1248-51V and port 1 of ES4024, the connection still exists. We can remove any one of the cable. That will not affect the connection. You can see the blocking port will become forwarding port.

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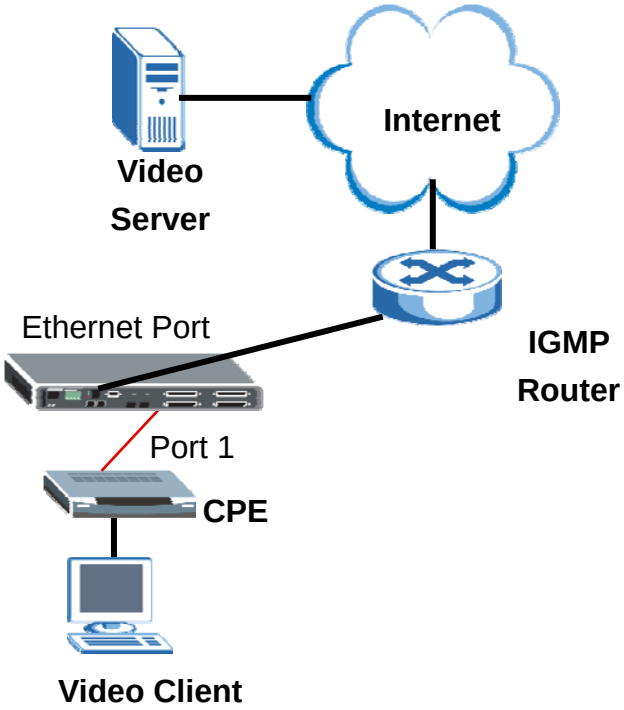
Status

System Up Time : 2:11:04

Port	Link	State	LACP	TxPkts	RxPkts	Errors	Tx KB/s	Rx KB/s	Up Time
1	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00
2	100M/F	FORWARDING	Disabled	217	683	2	0.0	0.0	0:01:44
3	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00
4	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00
5	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00
6	100M/F	FORWARDING	Disabled	3278	2698	0	0.0	0.0	0:14:32
7	Down	STOP	Disabled	0	0	0	0.0	0.0	0:00:00

Setting up the IGMP Snooping/IGMP Filtering

Without IGMP snooping multicast traffic is treated in the same manner as broadcast traffic, that is, it is forwarded to all port. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group. IGMP snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through the IP-DSLAM. IGMP filtering is for allowing a port to join some specific IGMP groups. This can be applied in Video service providers. They can only open some specific channels (groups) to specific ports.



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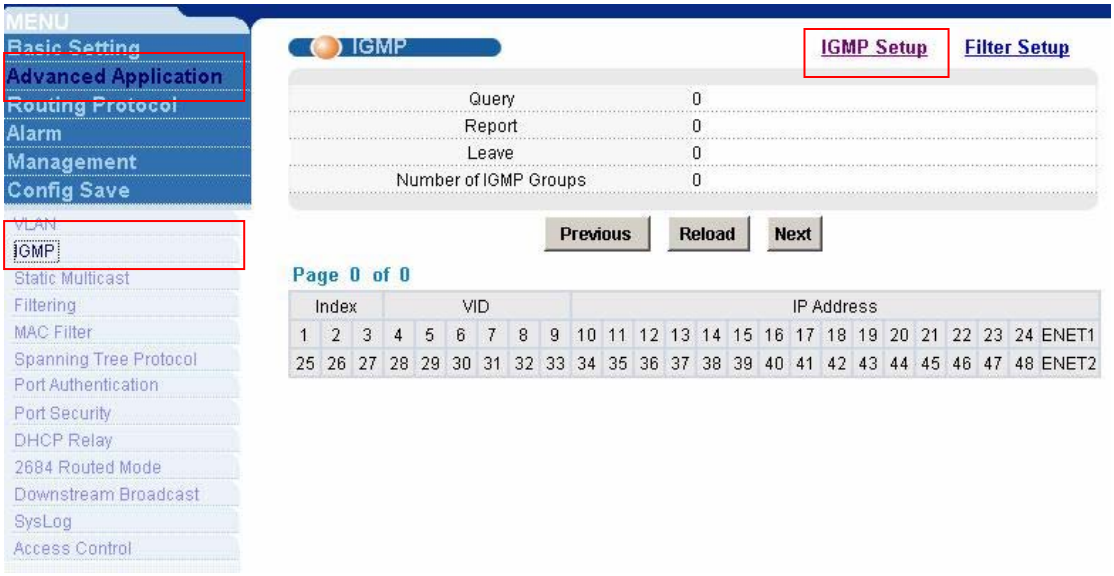
How to set up IGMP snooping/IGMP filtering

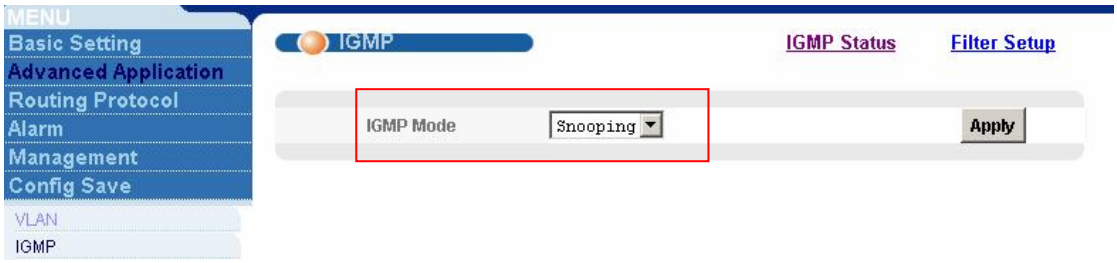
Here, we only set up the IES-1248-51V to support IGMP snooping and IGMP filtering. Please refer to the user guide of the Video Server and the subscriber device. We assume the video server provides three channels, movie 1 on 240.10.10.8 group, movie 2 on 240.10.10.9 group and movie 3 on 240.10.10.10 group. And we assume the subscriber want to subscribe two channel, movie 1 and movie 2. If we don't enable the IGMP snooping, every one can see all movies. If we don't set the IGMP filtering on the port, the subscriber behind the port will receive all movies.

1. IES-1248-51V settings

1.1 Enable IGMP Snooping

Click **IGMP setup** on IGMP Snooping page and enable the IGMP snooping. After a while, you will see the number of **Query** will increase when IES-1248-51V receives the query packet from IGMP router.





Meanwhile, if the subscriber sends the join packet, we can see the number of **Report** will increase and the IGMP table will be created.

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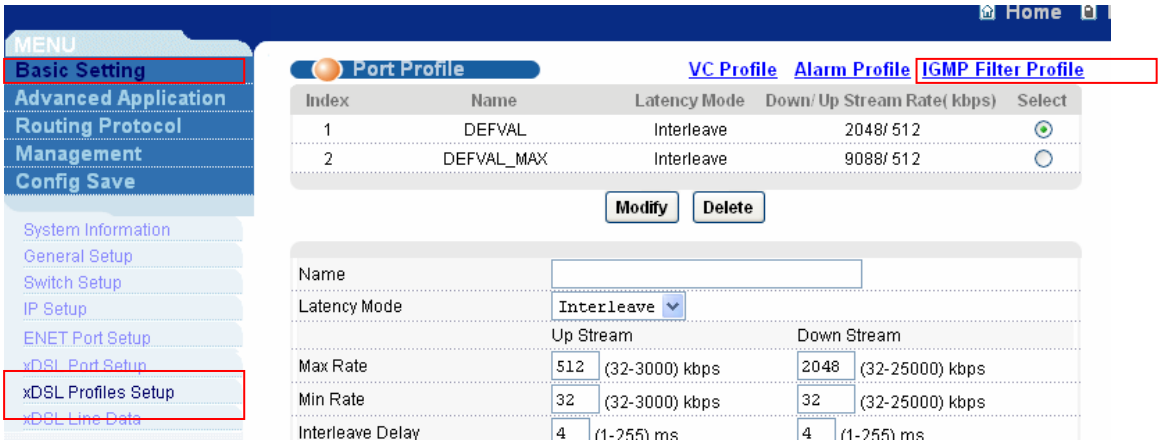
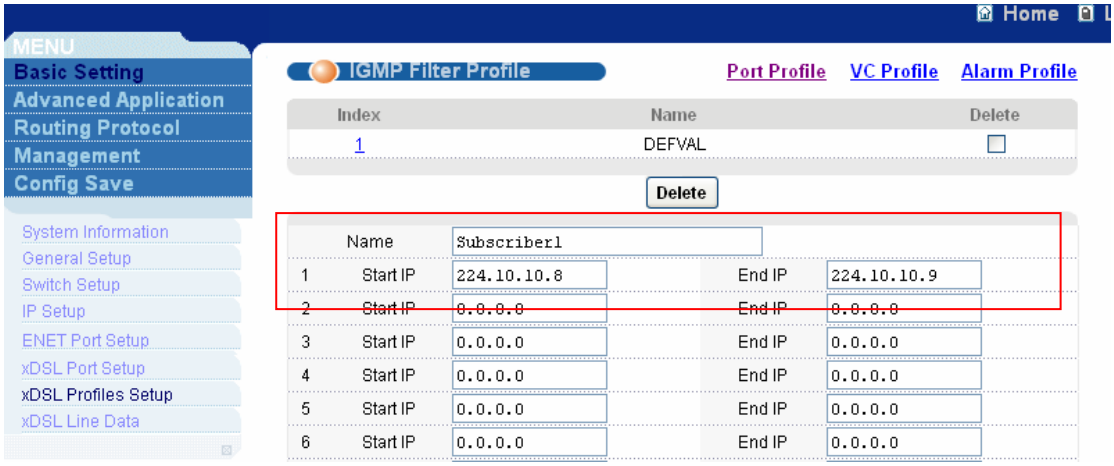
1.2 Set up IGMP Filtering

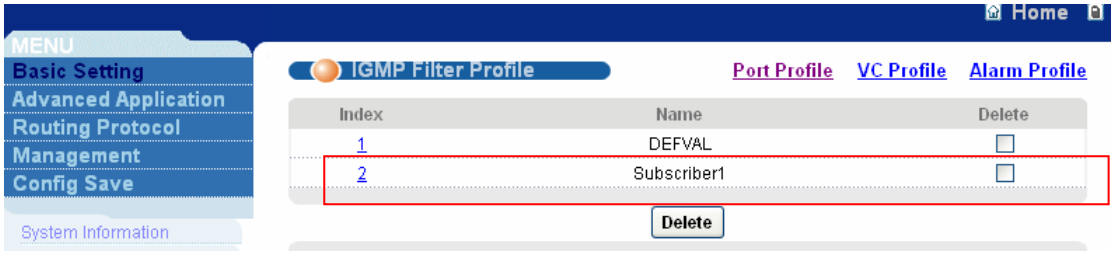
If we don't set up IGMP filtering, the subscriber will receive all the movies. We set up a IGMP filter Profile and apply it to specific port to limit the channels subscriber can see. Click **Basic Setting**, **xDSL Profiles Setup** in the navigation panel to display configuration screen as shown. And click the **IGMP Filter Profile** to show the setup page.



In this case we only allow the subscriber to join movie 1 and movie 2. That means only the groups 240.10.10.8 and 240.10.10.9 can be forwarded this subscribed port.



After create this profile, there is a new profile added in the list.



Then we need to apply the profile to port 1. Click **Basic Setting**, **xDSL Profiles Setup** in the navigation panel to display configuration screen as shown. Click the port index **1** to set up this port.

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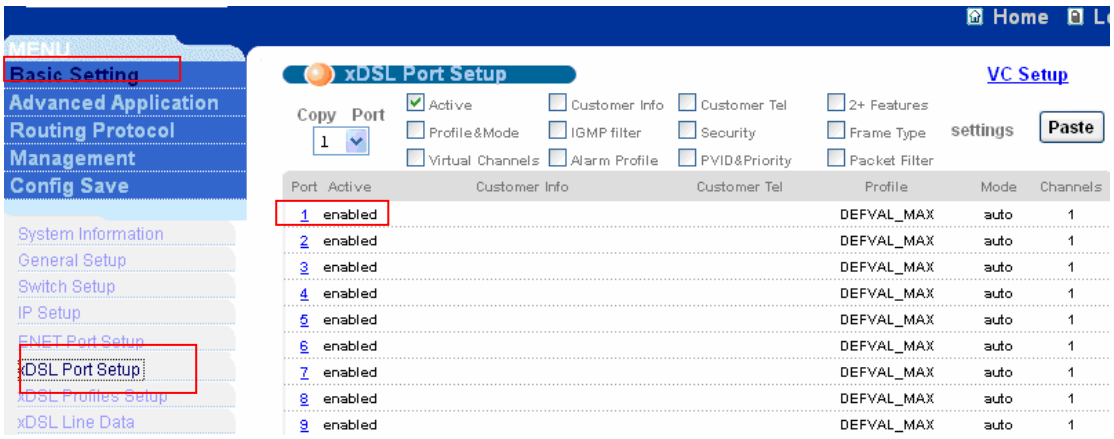

We select the **Subscriber1** in **IGMP Filter Profile** Combobox. And click **Apply** to let the setting take effect.

Go back to check the IGMP Snooping table. We will see only two channels allowed to be forwarded to port 1.

Static Multicast

What is Static Multicast Filter?

Static Multicast Filter allow network administrator to configure multicast group consisting of one or more ranges of MAC multicast addresses. An administrator can control multicast traffic per-switch-port basis with static multicast filter. By default, all multicast traffic are dropped without static multicast filter setup or IGMP snooping which cause some routing protocol such as RIPv2 and OSPF can not be passed through IP DSLAM. So administrator must do any configuration of static multicast filter to pass such routing protocol and other related application smoothly.

Some Well-known multicast group address:

224.0.0.1---------all systems on this subnet

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224.0.0.2---------all routers on this subnet

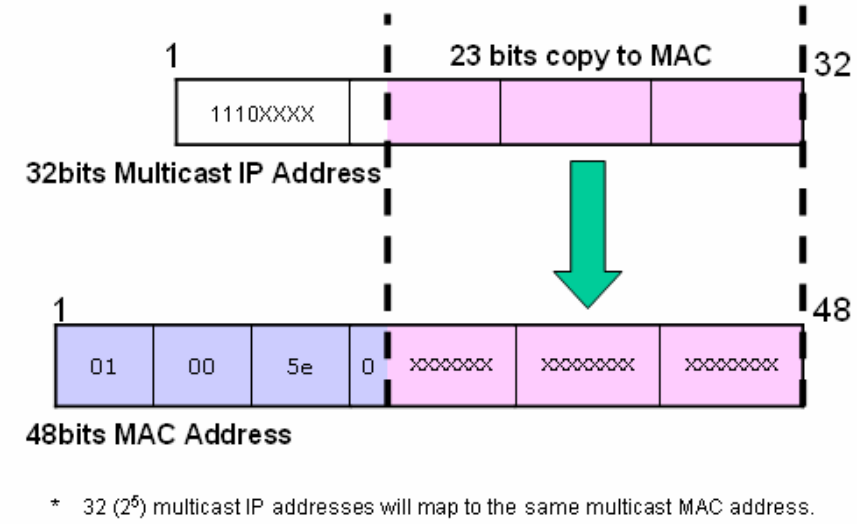
224.0.0.5---------all routers running OSPF

224.0.0.6---------all Designed Routers running OSPF

224.0.0.9---------for RIPv2

224.0.1.1---------for NTP

Before using static multicast filter, you must mapping Multicast IP address to Multicast MAC address because IES IPDSLAM using Multicast MAC address to forwarding multicast traffic.

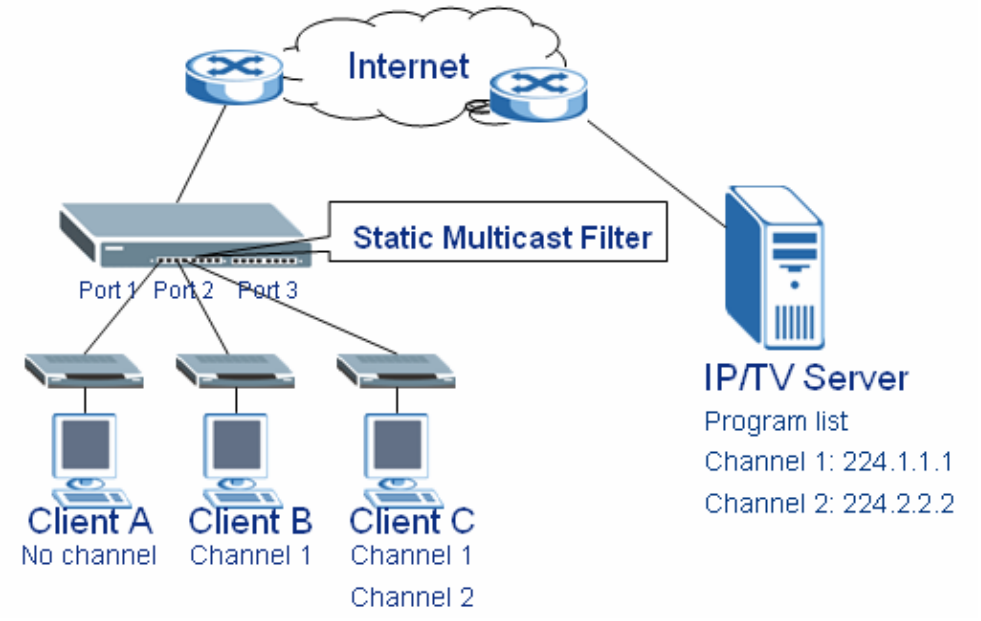


* 32 (2^5) multicast IP addresses will map to the same multicast MAC address.

This feature can also be combined with IGMP Snooping feature to make ports know multicast traffic that are not learned by IGMP Snooping or forbid specified ports to receive multicast traffic learned by IGMP Snooping.

Application Scenario

Scenario Description



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An ISP wants to provide multicast video service to end user and subscribes who with different pay enjoy different programs.

Client A (connect to ADSL port 1) is a normal subscribe, so he has no authority to access movie resource.

Client B (connect to ADSL port 2) is a pay subscribe, he has authority to access limited movie resource (for example, just only channel 1).

Client C (connect to ADSL port 3) is a VIP subscribe, so he has the highest authority to access all movie resource (for example, both channel 1 and 2)

Static Multicast Filters can specify which video channels (based on multicast MAC addresses) are allowed or denied to be received by each subscribe.

The Multicast traffic MAC address of different channels as follows

IGMP Query: 01:00:5E:00:00:01 (224.0.0.1)

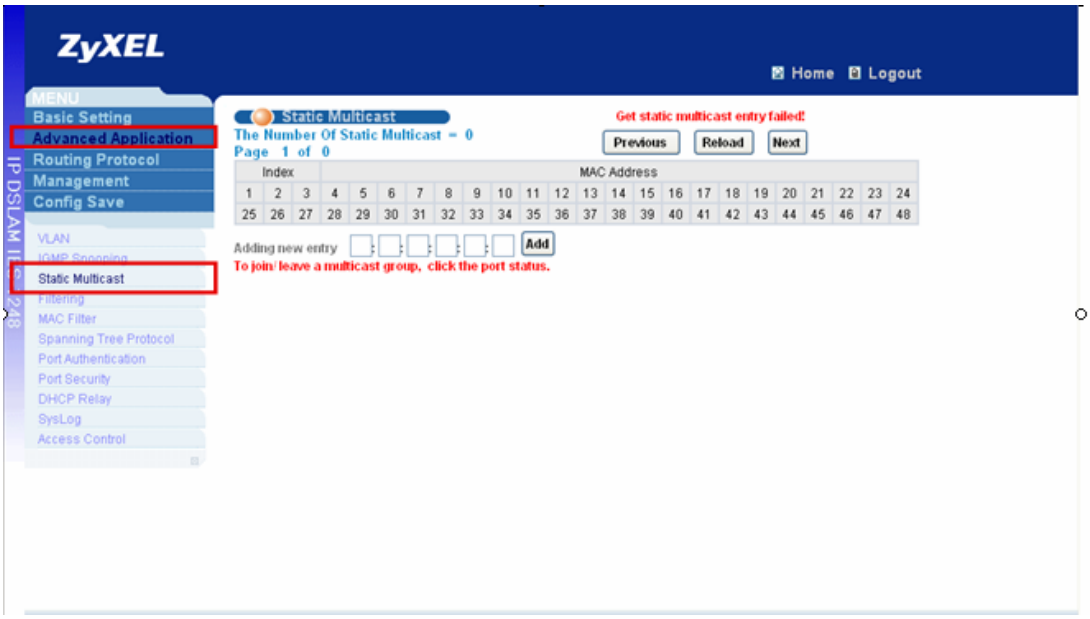
IGMP Report: 01:00:5E:00:00:02 (224.0.0.2)

Channel 1 multicast MAC address: 01:00:5E:01:01:01 (224.1.1.1)

Channel 2 multicast MAC address: 01:00:5E:02:02:02 (224.2.2.2)

How to configure Static Multicast filter

1. Please click “Advanced Application” first and then click “Static multicast” to bring up the following screen.



2. Please key in “01:00:5e:00:00:01” in the “Adding new entry” and click “Add” to bring up the following screen. “**V”** displays for member and **“-”** displays for non-member.

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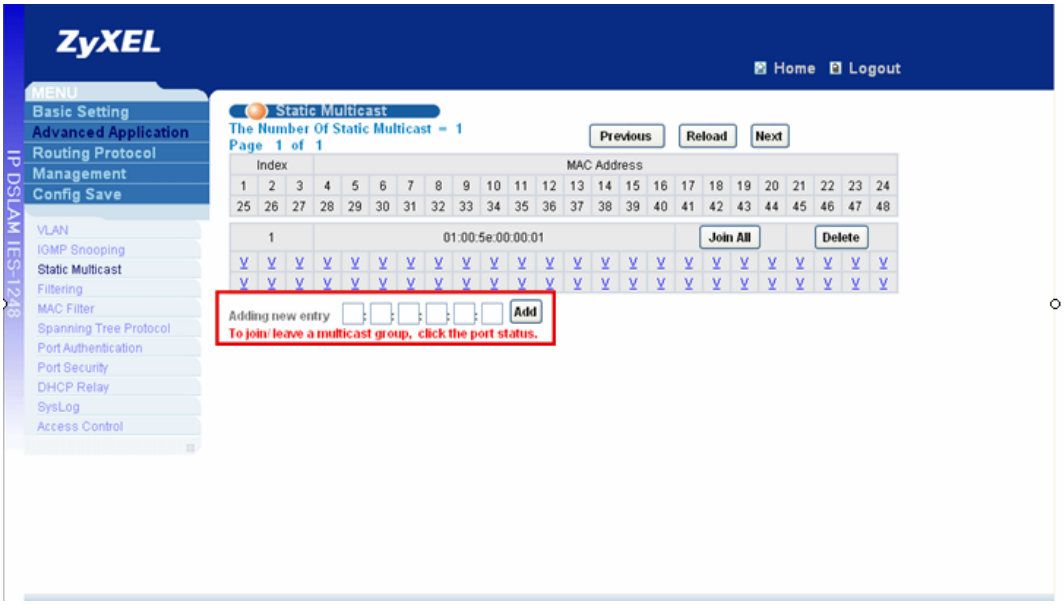
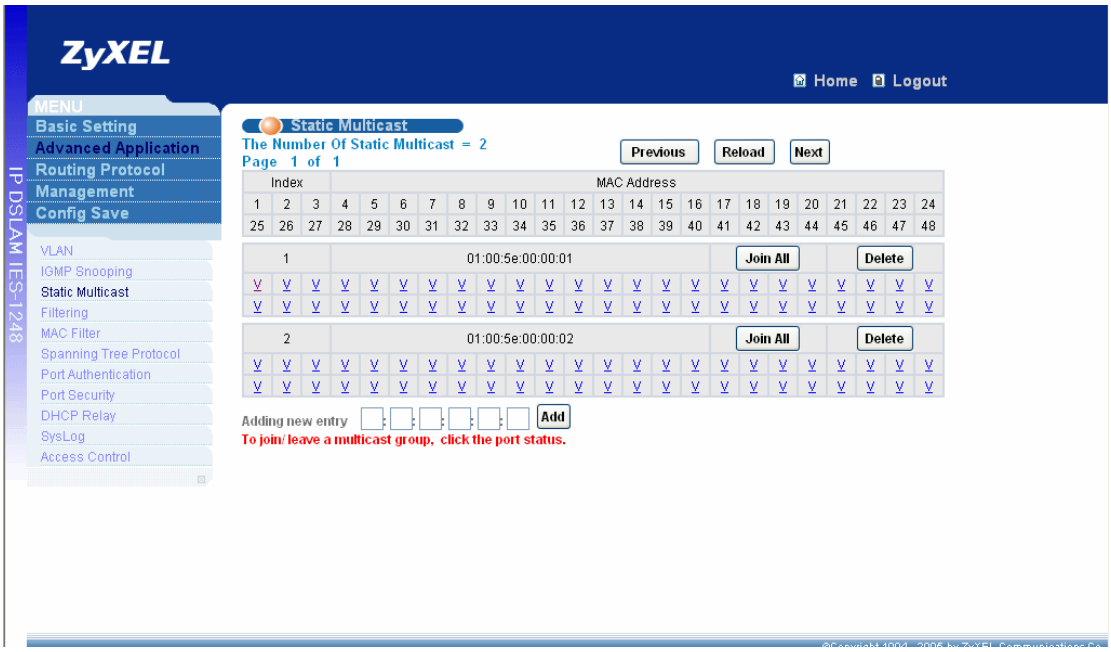


3. Please do the same step to add “01:00:5e:00:00:02” static multicast entry.



4. Please add channel 1 multicast MAC address “01:00:5e:01:01:01” and channel 2 multicast MAC address “01:00:5e:02:02:02” as above.

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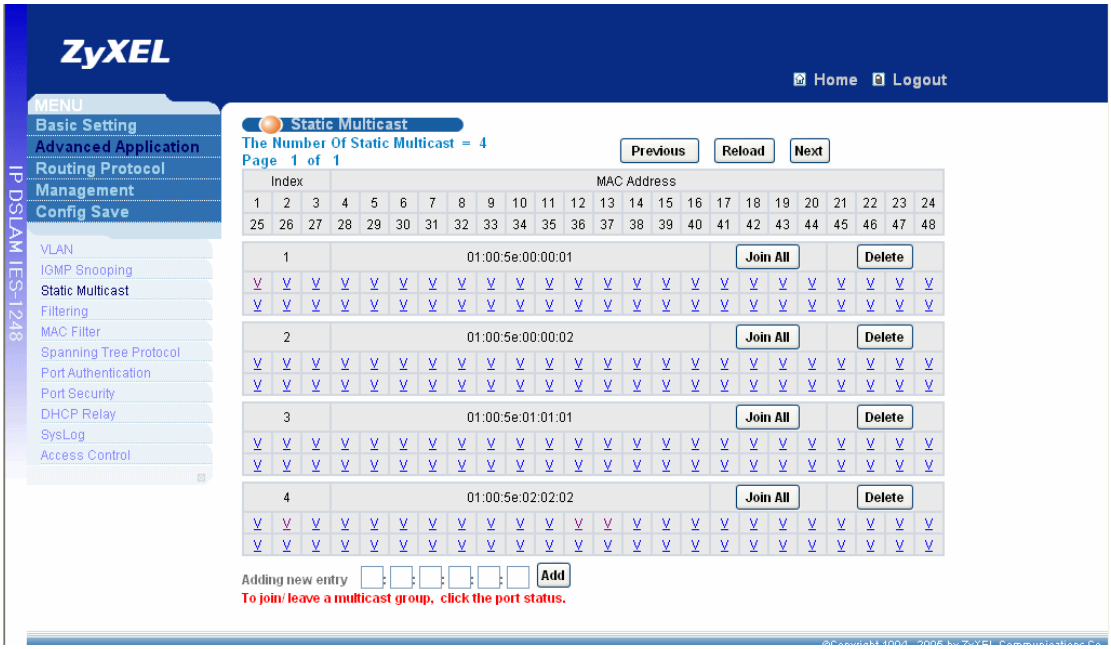
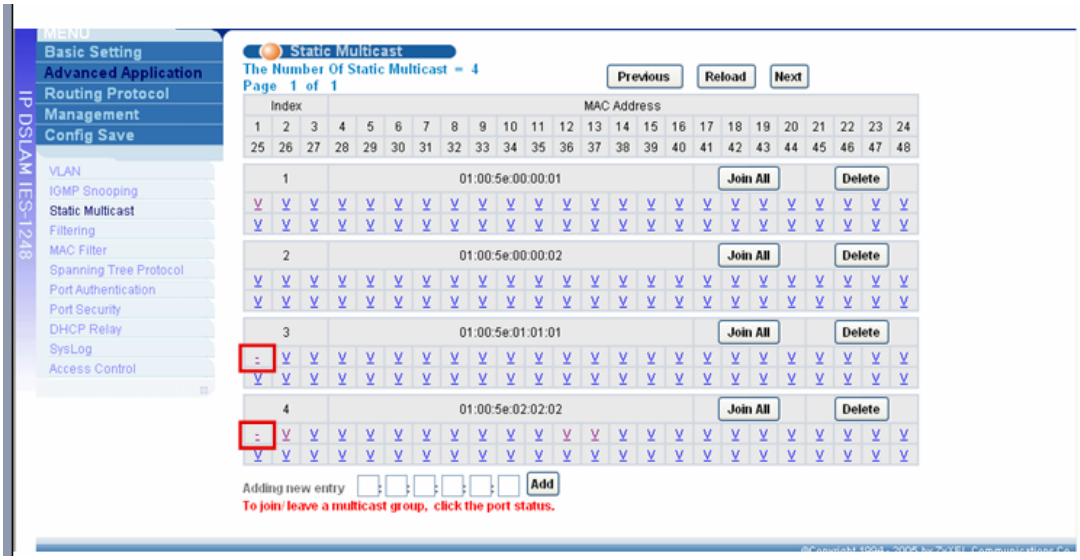


5. Because port 1 is not member of both 2 channels, so it should be set as non-member of these 2 channels. Please single-click “port 1” to change its status of group address “01:00:5e:01:01:01” and “01:00:5e:02:02:02” as non-member.



6. For port 2, set it as non-member of channel 2 “01:00:5e:02:02:02”

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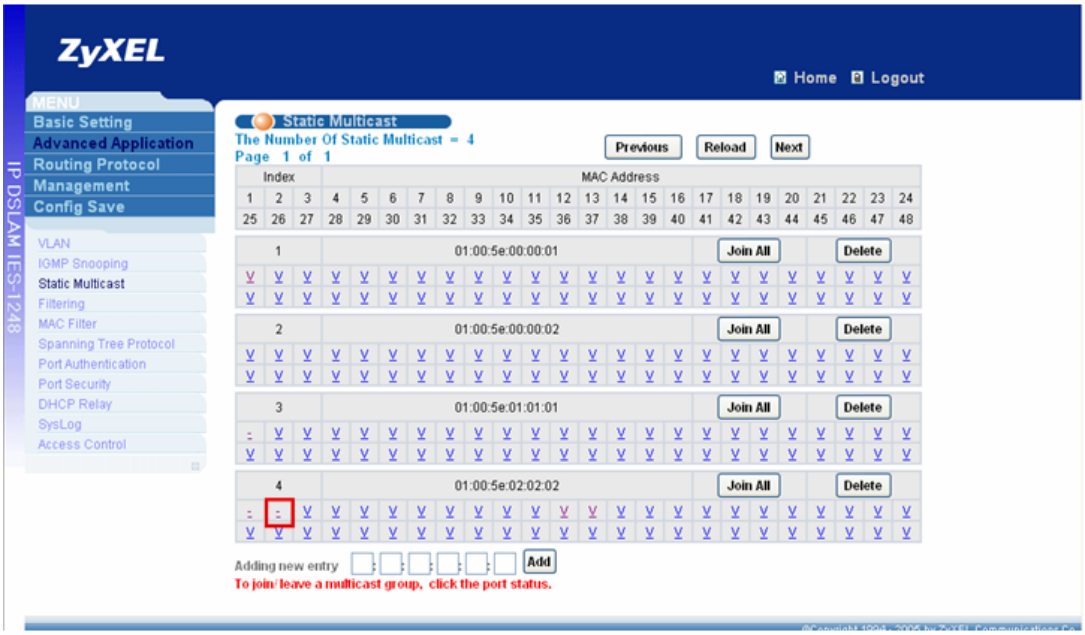

7. For port 3, no need to change anything because its status as member of these channels by default. Don't forget to click "Config Save" to save your configuration into flash.

CLI Command related:

switch	**Smcast**			**Use the static multicast filter**
		show		**Display all MAC addresses joined to ADSL ports**
		set	**<adsl port> <multicast MAC> <join|leave>**	**Use join|leave to add/remove multicast MAC address on specified ADSL ports, a range of ADSL ports or all ports,**
		delete	**<multicast MAC>**	**Remove a static multicast filter entry by deleting the associated MAC address.**

How to achieve the same goal by CLI command?

>switch smcast set 1,2,3 01005e000001 join

>switch smcast set 1,2,3 01005e000002 join

>switch smcast set 1 01005e010101 leave

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>switch smcast set 2,3 01005e010101 join

>switch smcast set 1,2 01005e020202 leave

>switch smcast set 3 01005e020202 join

>switch smcast show

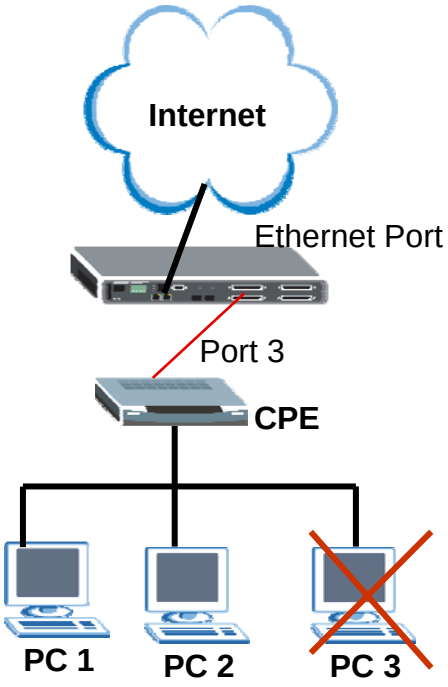
```
Static Mcast Groups                                          J:join L:leave

index MAC address       12345678901234567890123456789012345678901234567890123456789012345678
-------------------------------------------------------------------------------------------
    1 01:00:5e:00:00:01 JJJLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL
    2 01:00:5e:00:00:02 JJJLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL
    3 01:00:5e:01:01:01 LJJLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL
    4 01:00:5e:02:02:02 LLJLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL
```

PS: Default statuses of other ADSL ports without configuration are **DIFFERENT** between WEB GUI (default status is Join) and CLI Command (Default status is Leave), so please choose the better way to do static multicast filter configuration to get most convenience.

Limit the users behind the certain DSL port

ISP may want to limit the number of PC behind certain DSL port to access the Internet or allow PCs with specific MAC address to access the Internet. They can easily to achieve this with Port Security and MAC filter features.



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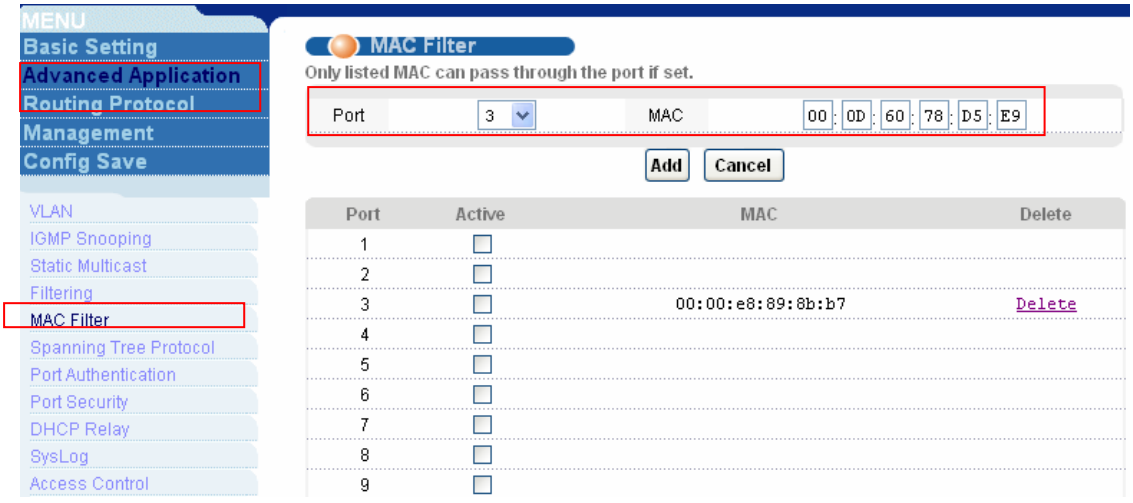
How to set up MAC Filter/Port Security

Here, we will set up an environment to allow PCs with certain MAC address and the number of PCs behind port 3 to access the Internet.

1. IES-1248-51V settings

1.1 Set up MAC filter

Click **Advanced Application**, **MAC Filter** in the navigation panel to display configuration screen as shown. You will see the **MAC Filter** setup page. Select the Port 3 and input the MAC address you allow to access the Internet. And don't forget the press **Apply** button to let it takes effect.



You will see the MAC address in the MAC field. Then check the **Active** check box of Port 3 and press **Apply** button to enable this feature. Only the MAC addresses listed here can access the Internet behind certain ports.

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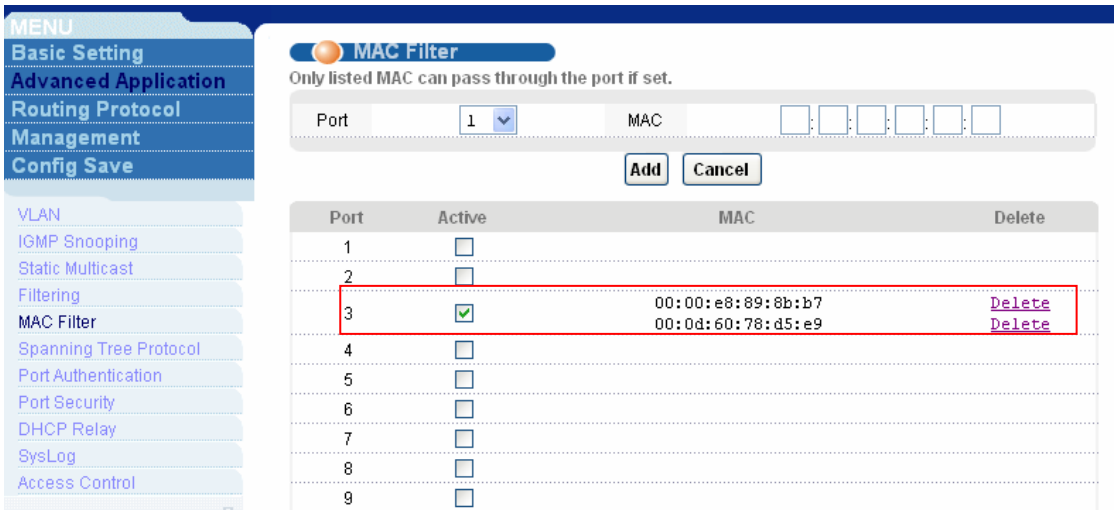
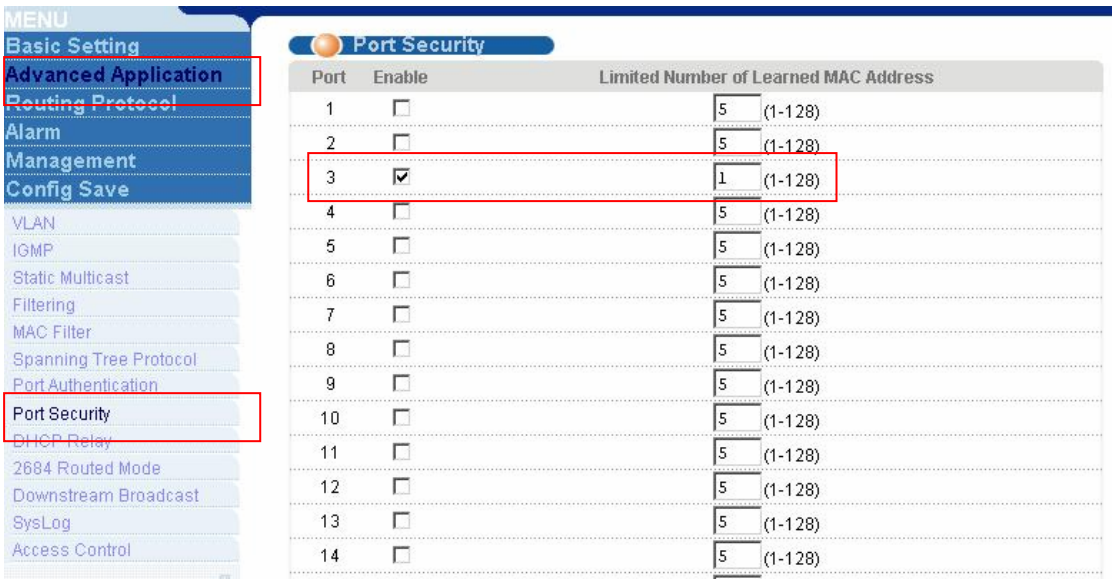


1.2 Set up Port Security

Click **Advanced Application**, **Port Security** in the navigation panel to display configuration screen as shown. You will see the **Port Security** setup page. Check the **Enable** check box of Port 3 and input the MAC address number you want to limit to access the Internet. And don't forget the press **Apply** button to let it takes effect. Note that the MAC filter and Port security can't be used at the same time.



Click **Management**, **MAC Table** in the navigation panel to display configuration screen as shown. And select port 3. You will see the MAC table will be shown as you configured in previous steps.

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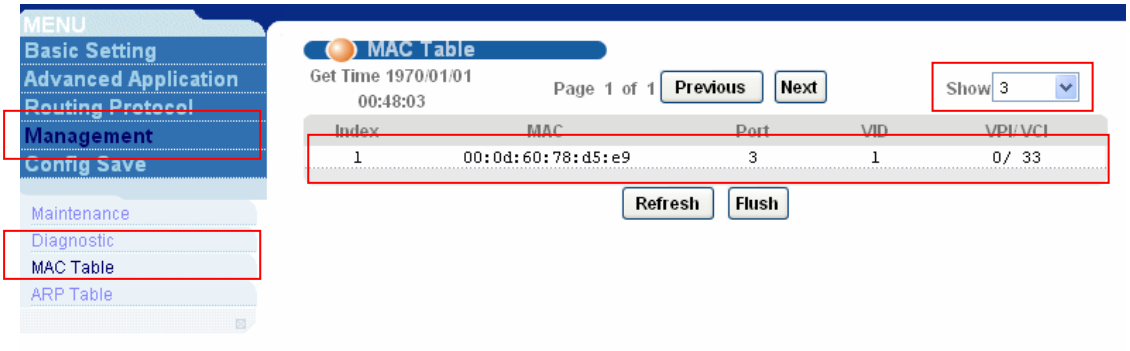
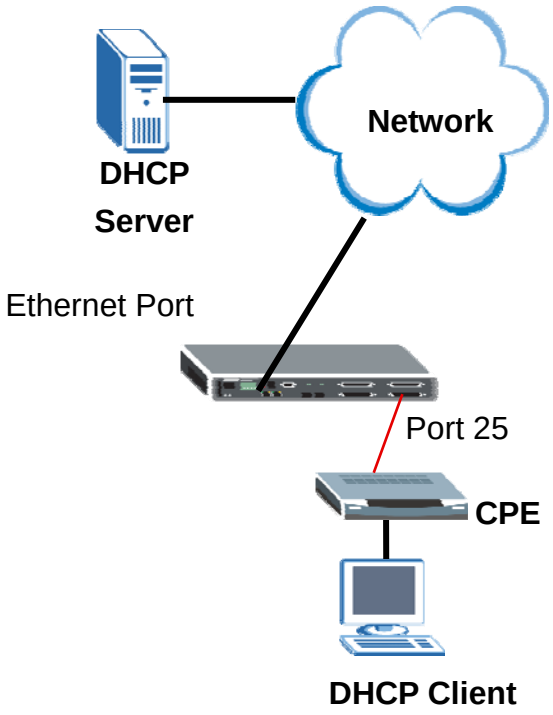


DHCP Relay Option 82 Application

ISP may want to limit the number of IP address or deliver some specific IP addresses according to certain DSL port, VLAN ID and option 82 string. They can easily to achieve this with DHCP Relay Option 82 feature and a DHCP server supporting Option 82 function.



How to set up DHCP Relay Option 82 Environment

Here, we will set up an environment to allow a PC get DHCP IP address in specific IP

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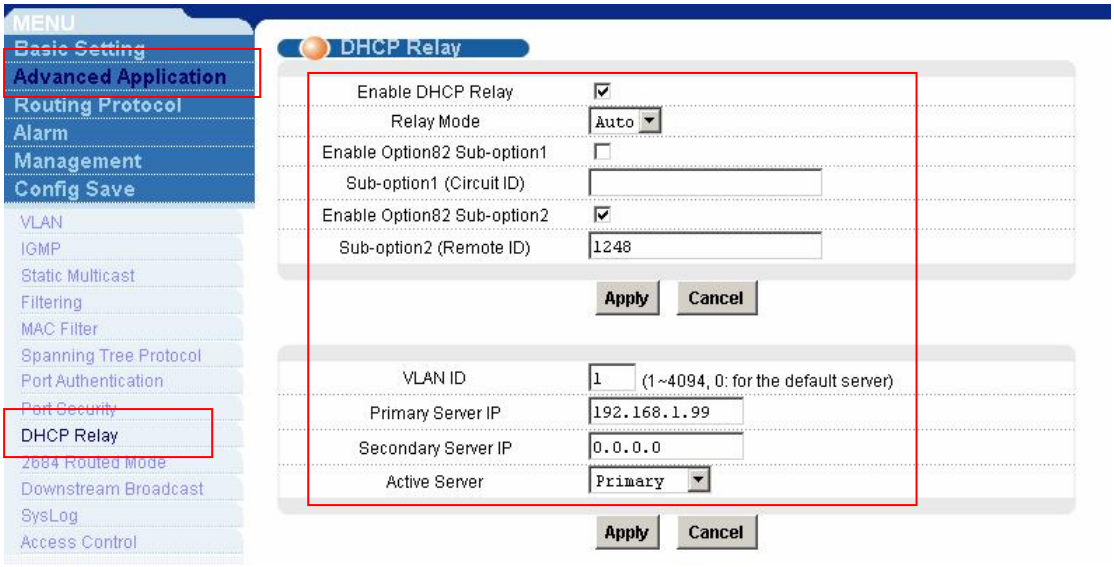
pool according to its DSL port, VLAN ID and the option 82 string. In this case, the PC is behind 25th DSL port and the option 82 string is a string "1248". We use the IP Commander as DHCP server. Its IP is 192.168.1.99 and the IP pool is between 192.168.1.201 and 192.168.1.203 for VID=1, DSL port=25 and the option 82 string is "1248".

1. IES-1248-51V settings

Click **Advanced Application**, **DHCP Relay** in the navigation panel to display configuration screen as shown. You will see the **DHCP Relay** setup page. Enable the DHCP relay and Option 82 function. Fill the IP address of DHCP server in this page. The IP address is 192.168.1.99 in our case. Also, enter "1248" as the Option 82 string.



2. CPE settings

Connect CPE to the 25th DSL port. Please see former applications for Detailed settings.

3. IP Commander settings

Open IP Commander. Right click "IP commander and then click "**connect new server**".

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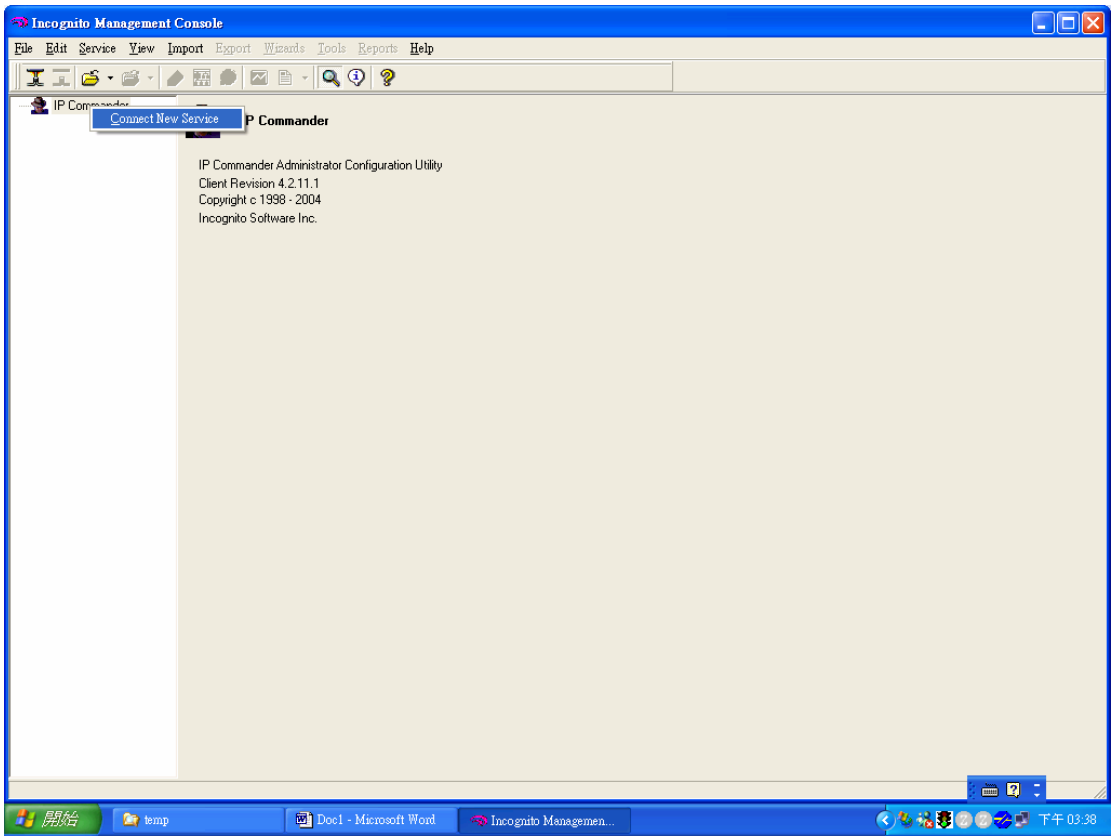
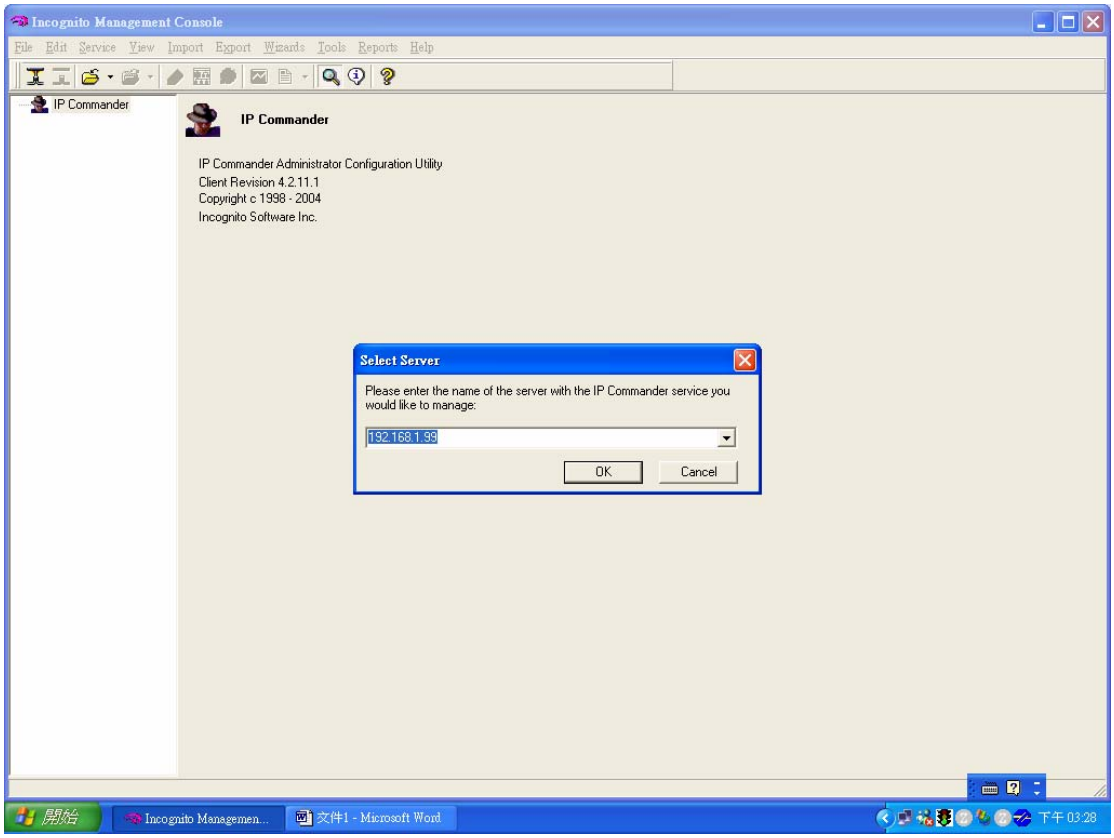


Input the DHCP IP address or domain name and click “ok”. Our IP is 192.168.1.99.



Input user name and password. The default user name is “administrator” and

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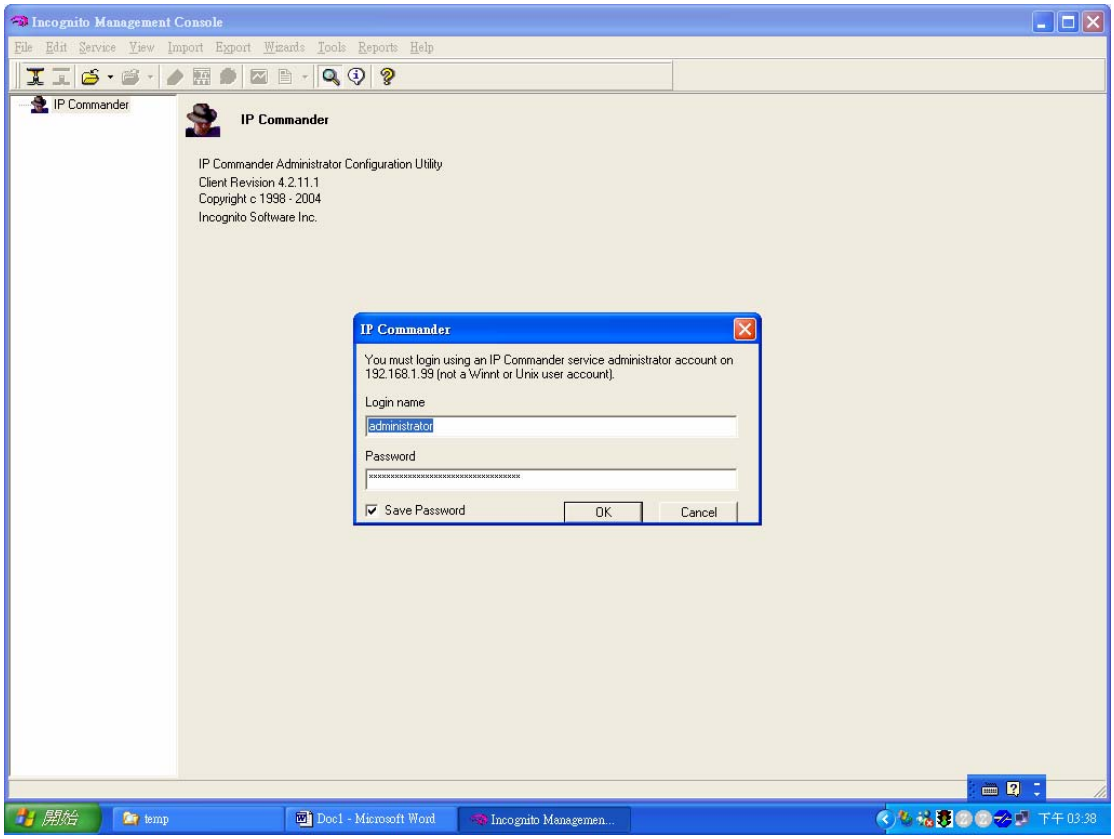
password is “incognito”.



It will bring up the following screen, please make sure that your DHCP is in “**online**” status. Then click “**wizard**” in the top tool bars and select “**rule wizard**”.

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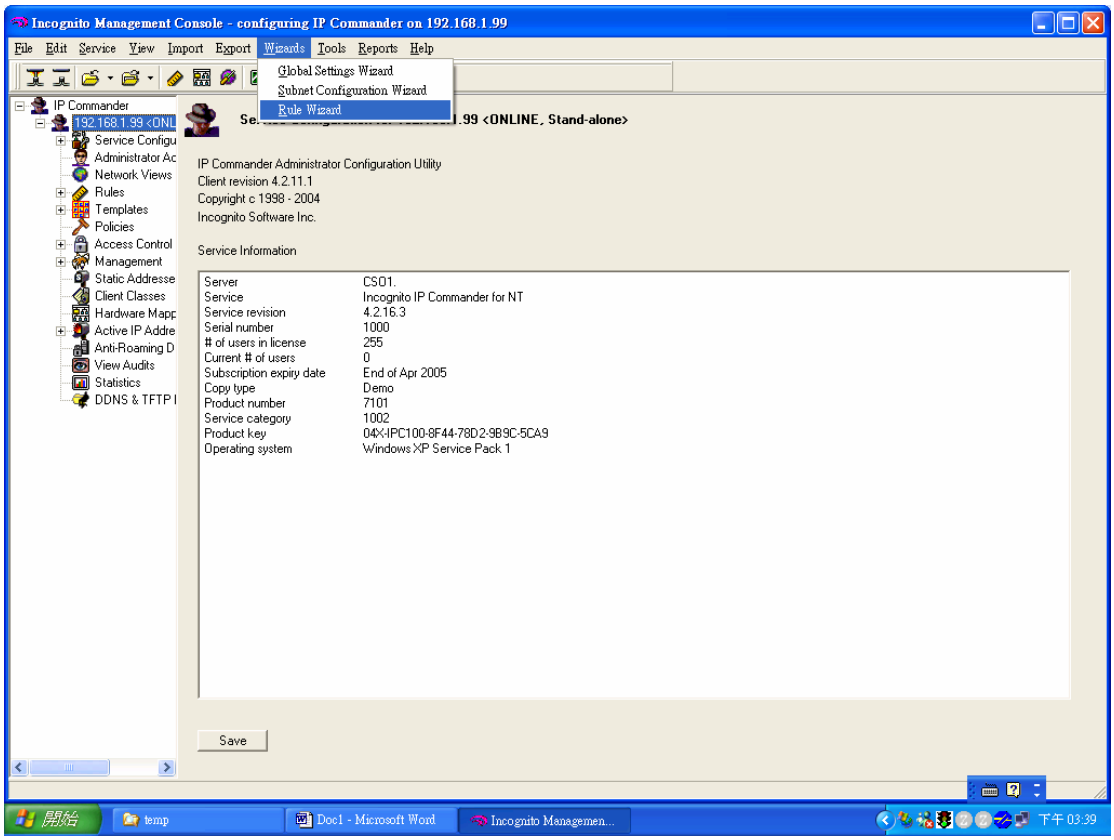
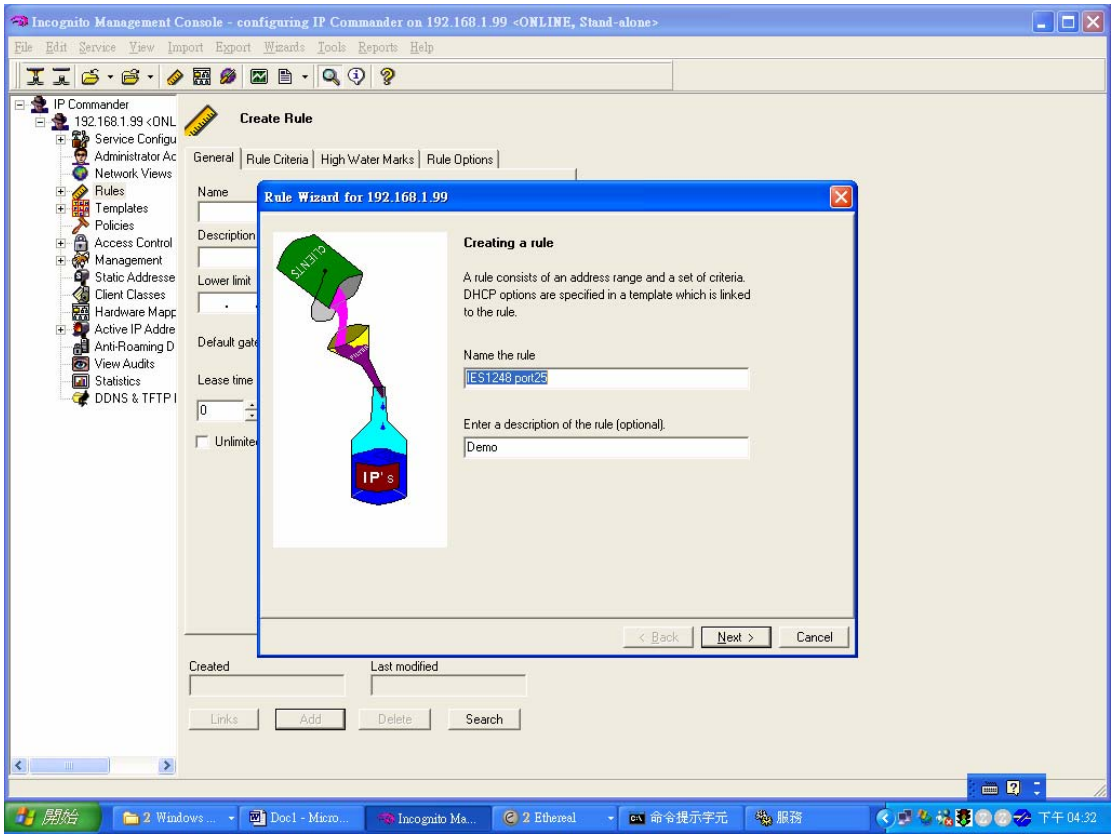


Give a name and description to the new rule.



Assign a range of IP addresses or just one IP address to this rule. In our case, we set

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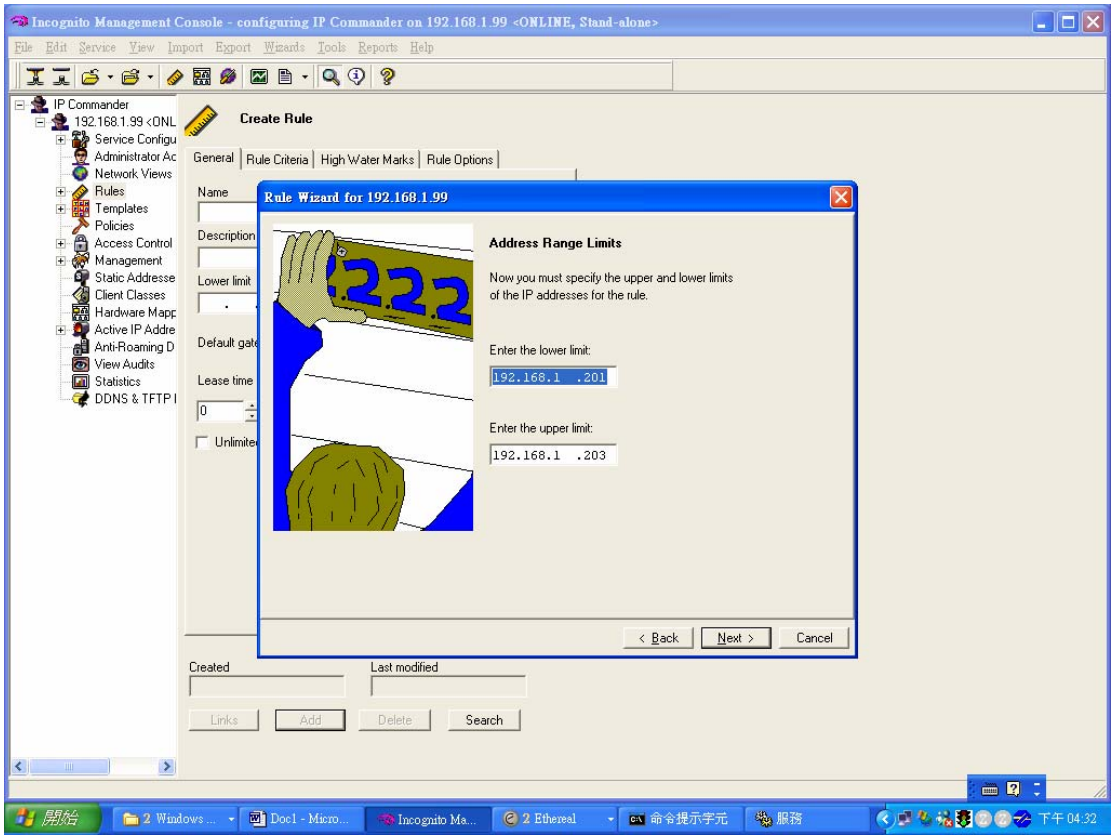
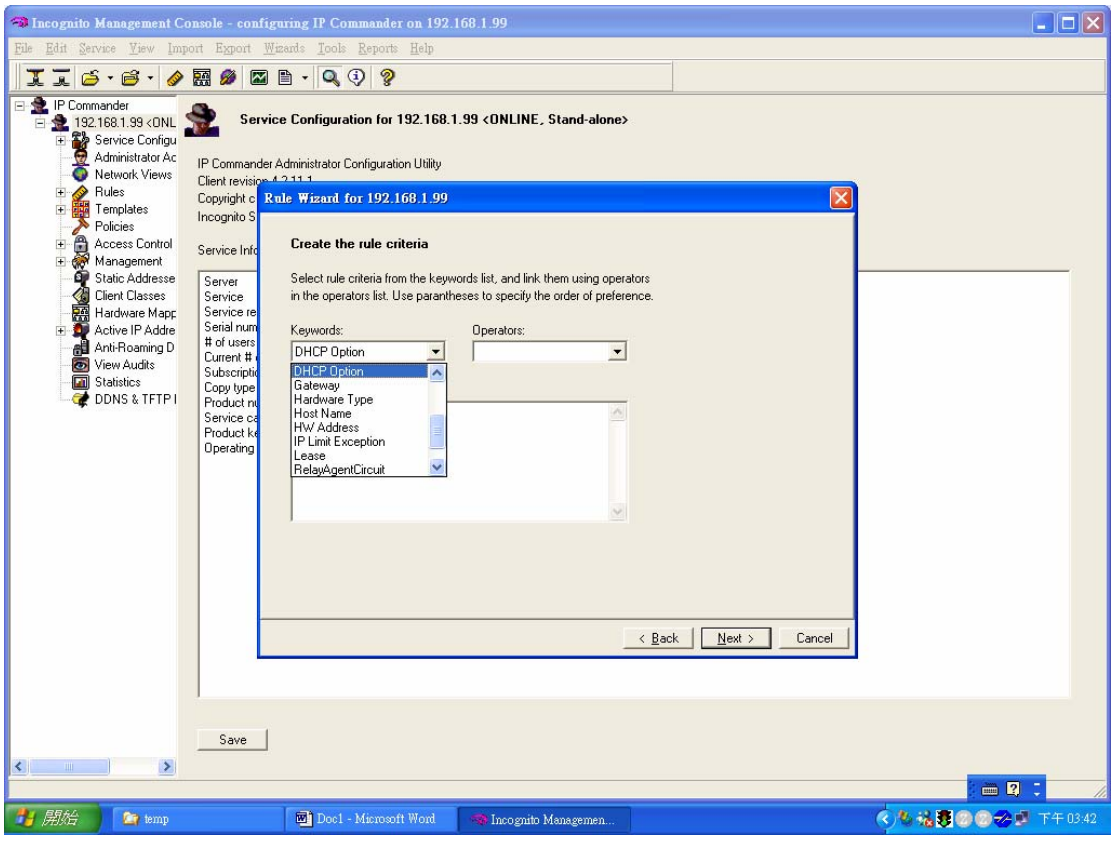
the IP pool from 192.168.1.201 to 192.168.1.203.



After input IP pool, we select “DHCP Option” in Keywords combobox.



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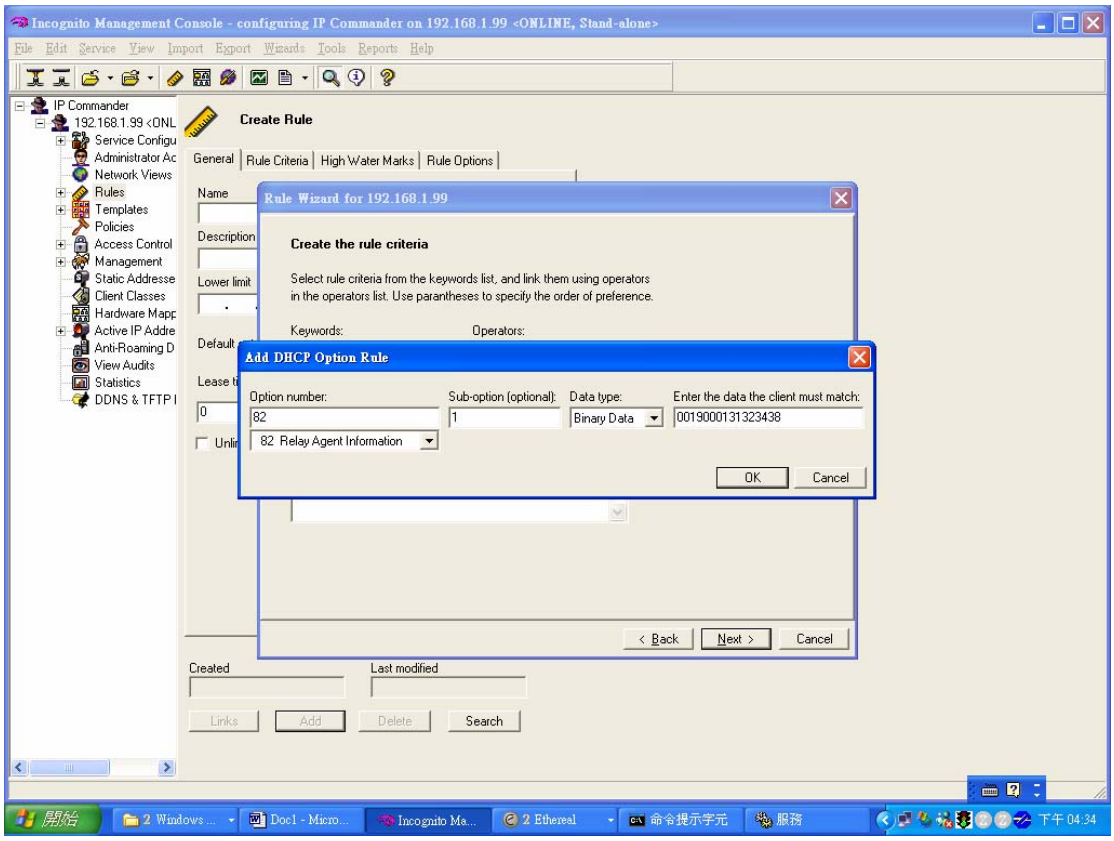
After select the “DHCP Option”, it will pop up “Add DHCP Option Rule” dialog. Select “option 82 Relay Agent Information”, sub-option 1, binary data. For port 25, VLAN 1, “1248”, please key in “0019000131323438” as the key value and click OK. Please note that the first 2 bytes define port number, the second 2 bytes is VLAN ID and the other bytes are the Option 82 string.



After you finish above step, you will see the following figure.

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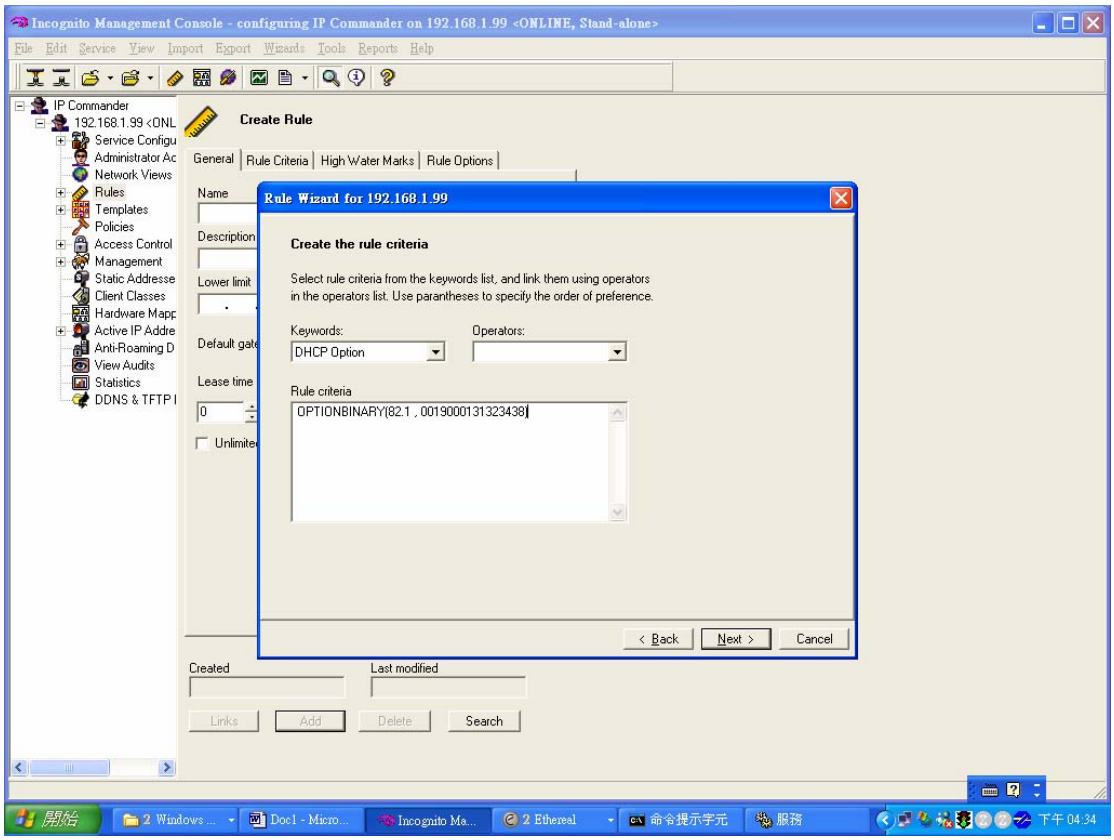
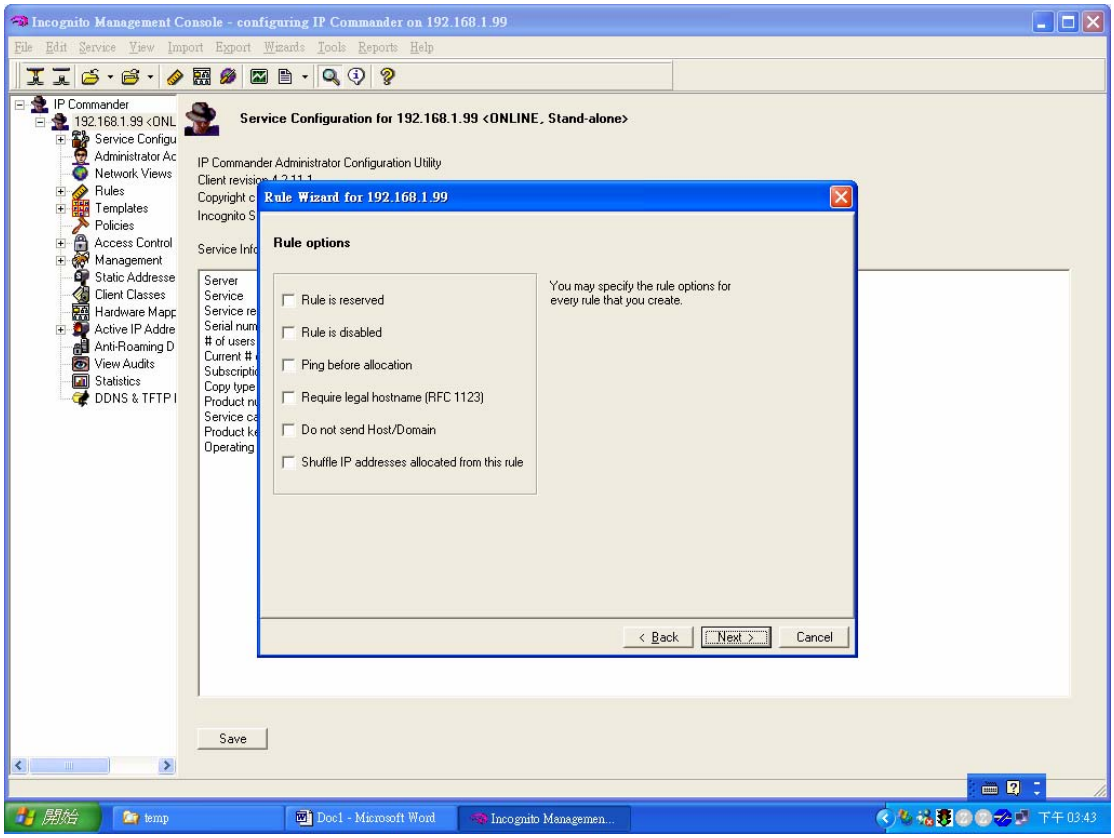


Then pop up the following screen and you can just press **Next** button.


Incognito Management Console - configuring IP Commander on 192.168.1.99
Service Configuration for 192.168.1.99 <ONLINE, Stand-alone>
IP Commander Administrator Configuration Utility
Rule Wizard for 192.168.1.99
Rule options
You may specify the rule options for every rule that you create.
Rule is reserved
Rule is disabled
Ping before allocation
Require legal hostname (RFC 1123)
Do not send Host/Domain
Shuffle IP addresses allocated from this rule
< Back
Next >
Cancel
Save

Then you can add DHCP template (option) such as gateway, DNS server and so on.

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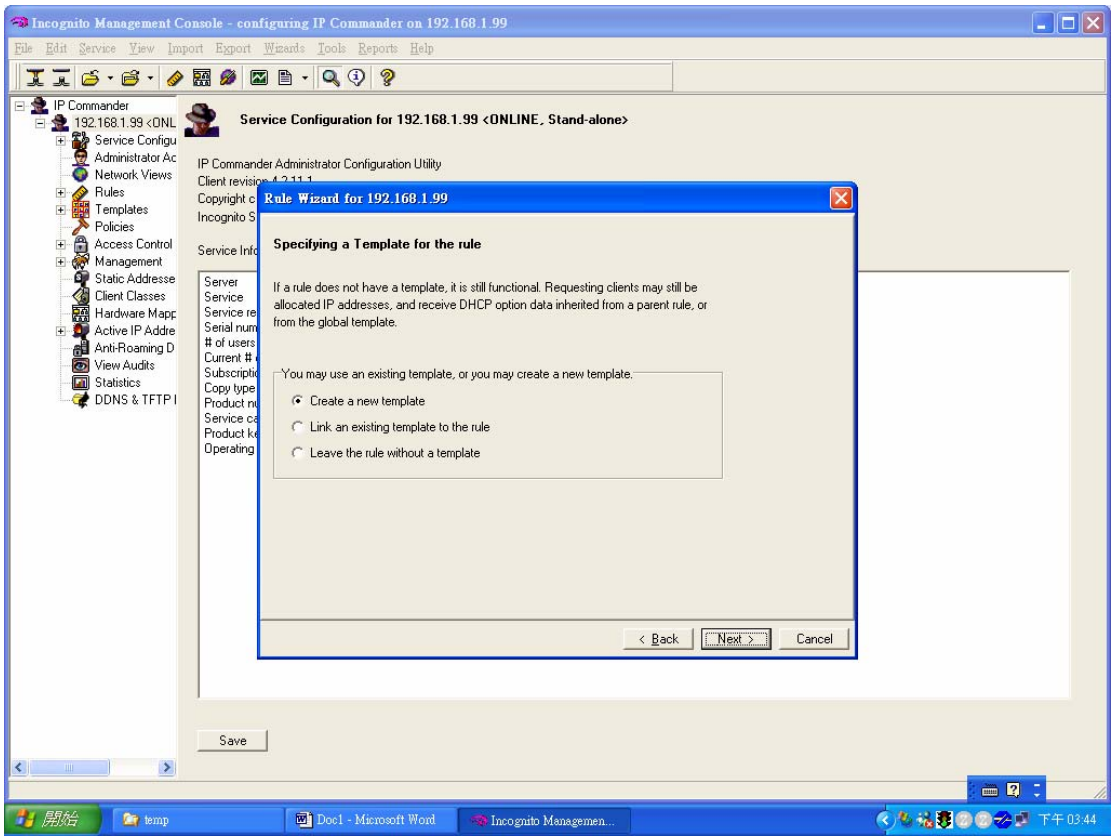
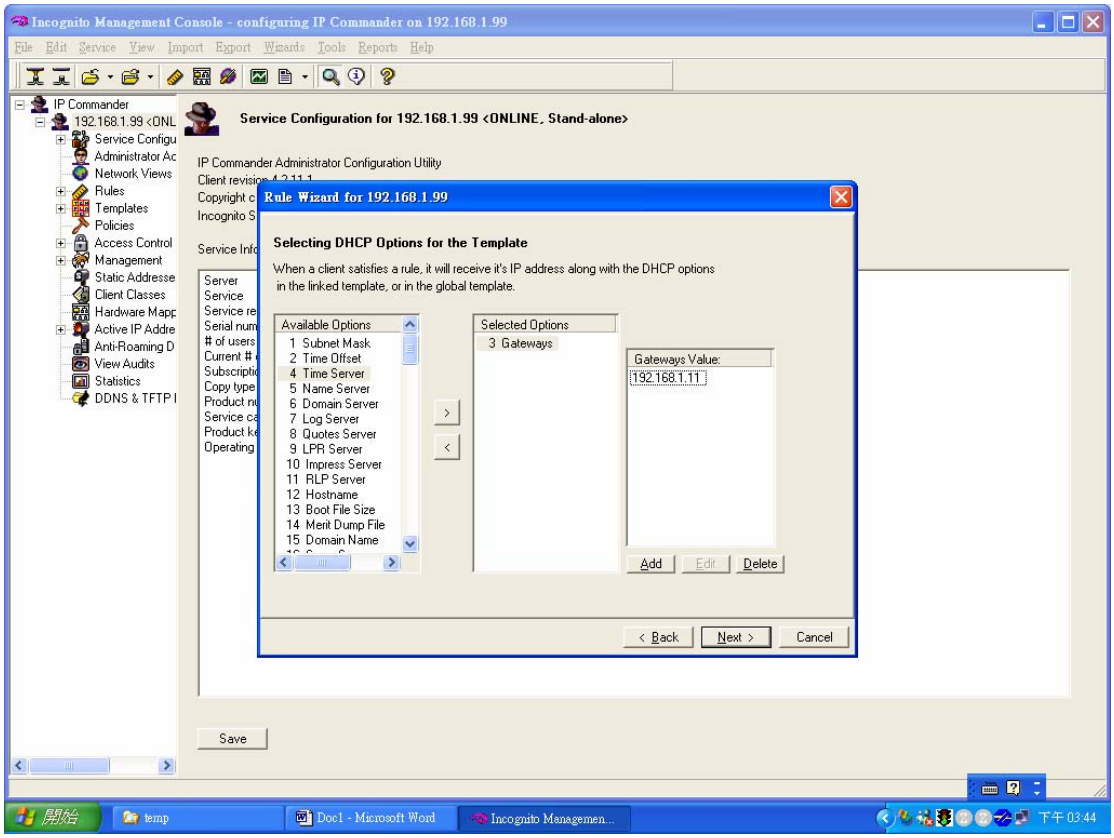

Incognito Management Console - configuring IP Commander on 192.168.1.99
Service Configuration for 192.168.1.99 <ONLINE, Stand-alone>
IP Commander Administrator Configuration Utility
Rule Wizard for 192.168.1.99
Specifying a Template for the rule
If a rule does not have a template, it is still functional. Requesting clients may still be allocated IP addresses, and receive DHCP option data inherited from a parent rule, or from the global template.
You may use an existing template, or you may create a new template.
Create a new template
Link an existing template to the rule
Leave the rule without a template
< Back
Next >
Cancel
Save

Here we use “192.168.1.1” as gateway IP address of DHCP client PC.



You can apply DDNS service to DHCP server or not.

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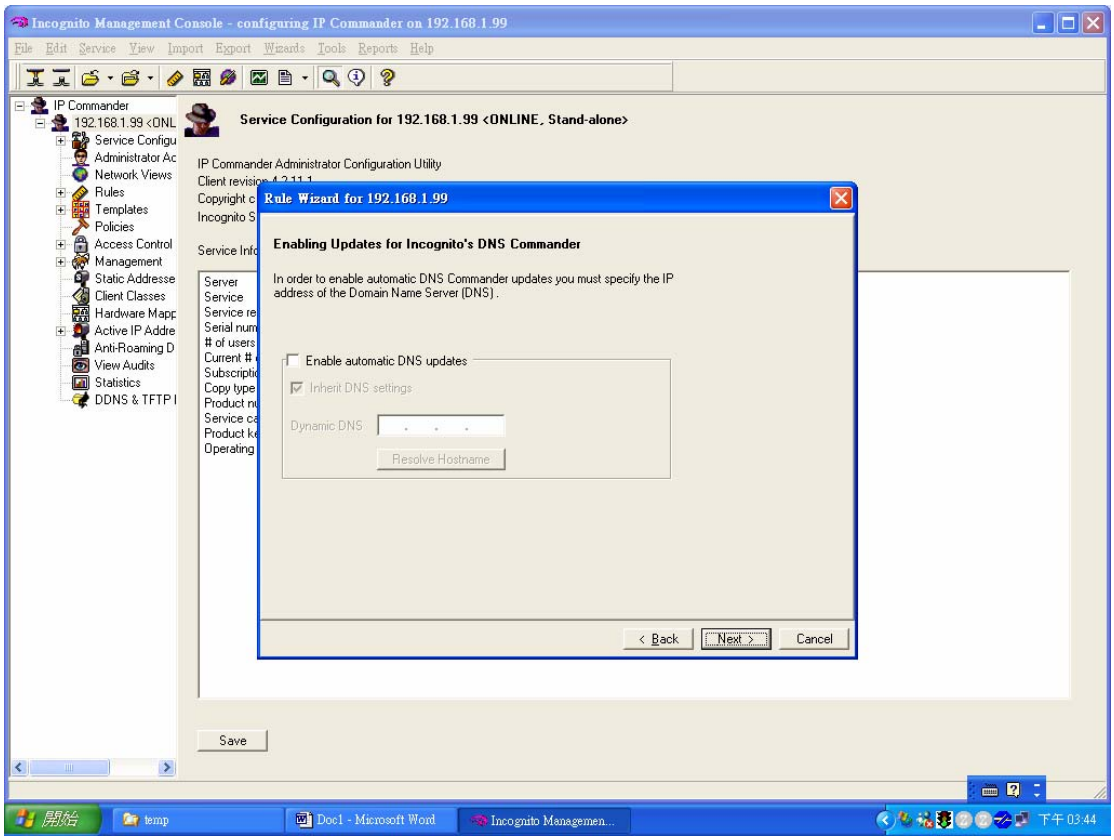
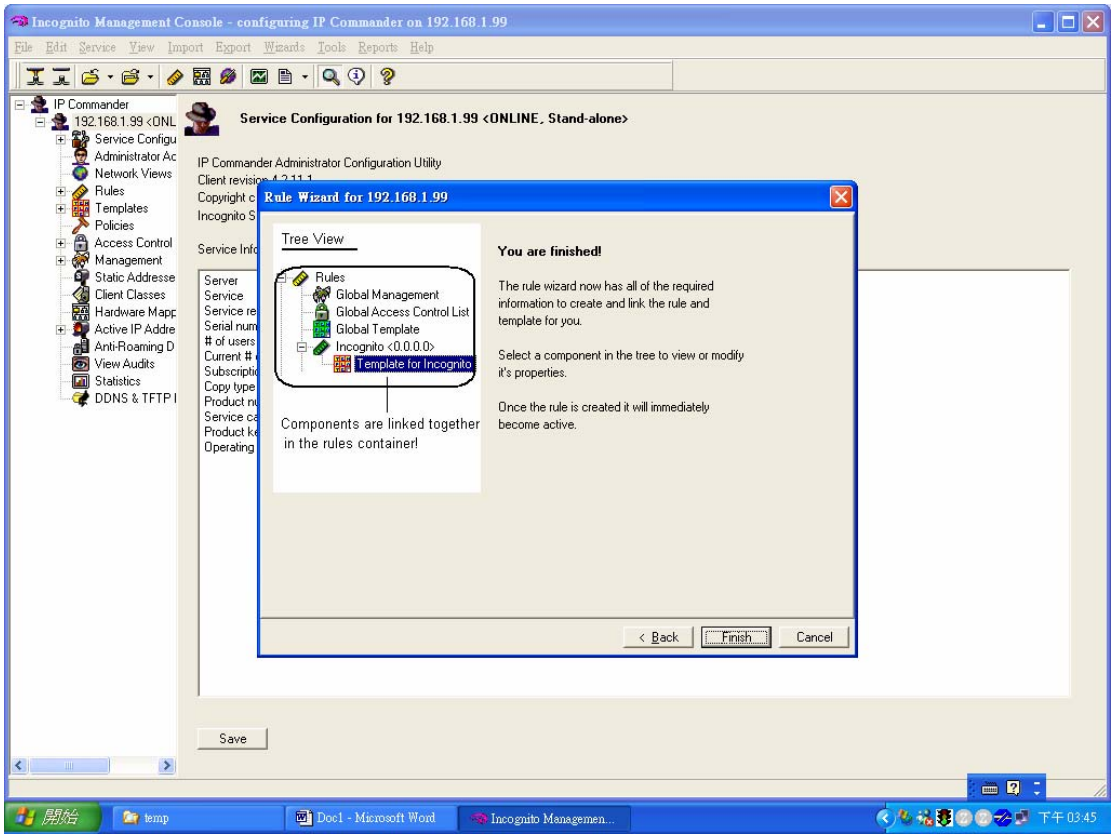

Incognito Management Console - configuring IP Commander on 192.168.1.99
Service Configuration for 192.168.1.99 <ONLINE, Stand-alone>
Rule Wizard for 192.168.1.99
Enabling Updates for Incognito's DNS Commander
In order to enable automatic DNS Commander updates you must specify the IP address of the Domain Name Server (DNS).
Enable automatic DNS updates
Inherit DNS settings
Dynamic DNS
Resolve Hostname
< Back
Next >
Cancel
Save

The rule creation has been finished.


Incognito Management Console - configuring IP Commander on 192.168.1.99
Service Configuration for 192.168.1.99 <ONLINE, Stand-alone>
Rule Wizard for 192.168.1.99
Tree View
Rules
Global Management
Global Access Control List
Global Template
Incognito <0.0.0.0>
Template for Incognito
Components are linked together in the rules container!
You are finished!
The rule wizard now has all of the required information to create and link the rule and template for you.
Select a component in the tree to view or modify it's properties.
Once the rule is created it will immediately become active.
< Back
Finish
Cancel
Save

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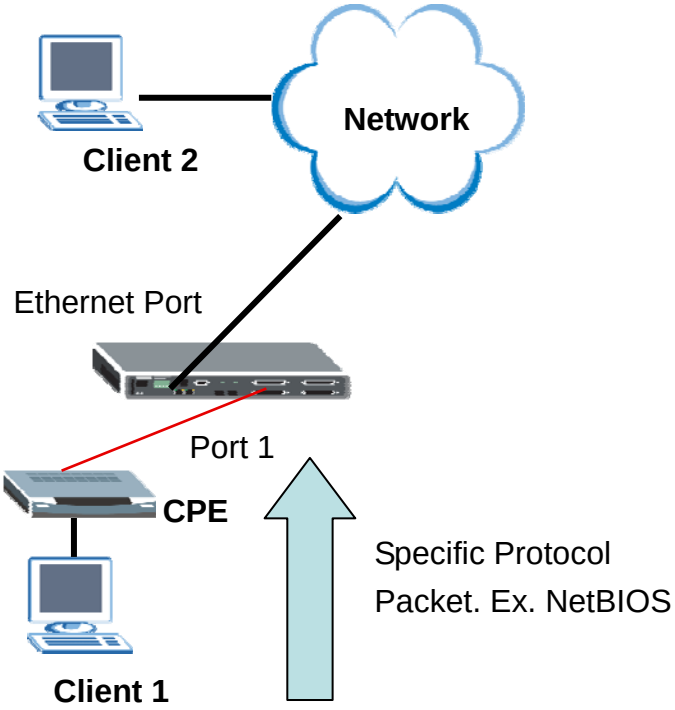
After finishing all above procedures, your PC will get the IP address 192.168.1.201 when you send a DHCP request.

Filter Some Certain Packet

ISP may want to filter some kinds of packets. IES-1248-51V provides “Packet Filter” function to filter some specific packets, like IP, ARP, DHCP, EAPoL, PPPoE, NETBIOS and IGMP.



How to Filter Some Specific Packet

Here, we will set up an environment to block NETBIOS protocol packets.

1. IES-1248-51V settings

Click **Advanced Application**, **Filter** in the navigation panel to display configuration screen as shown. You will see the **Packet Filter** setup page.

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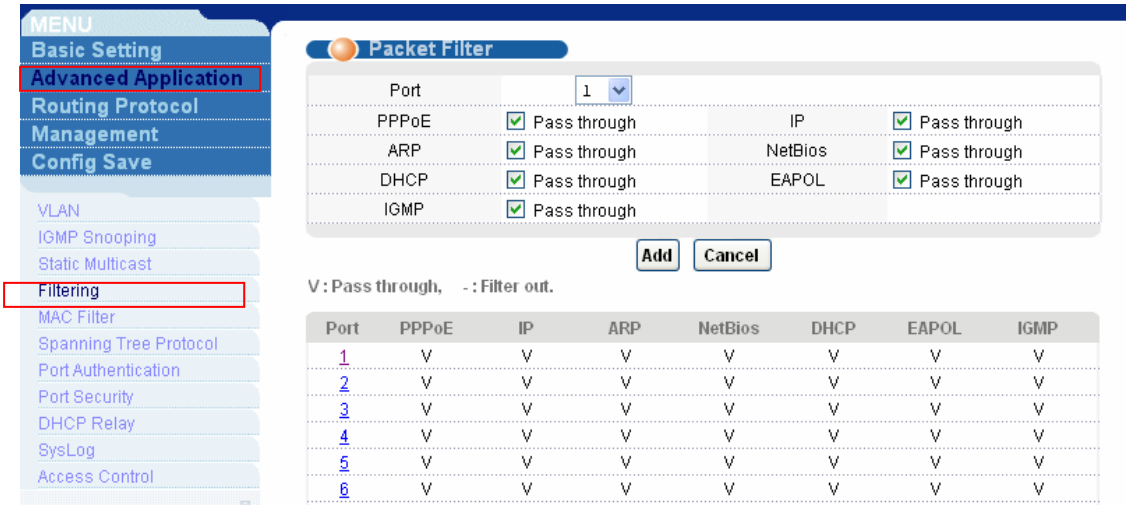
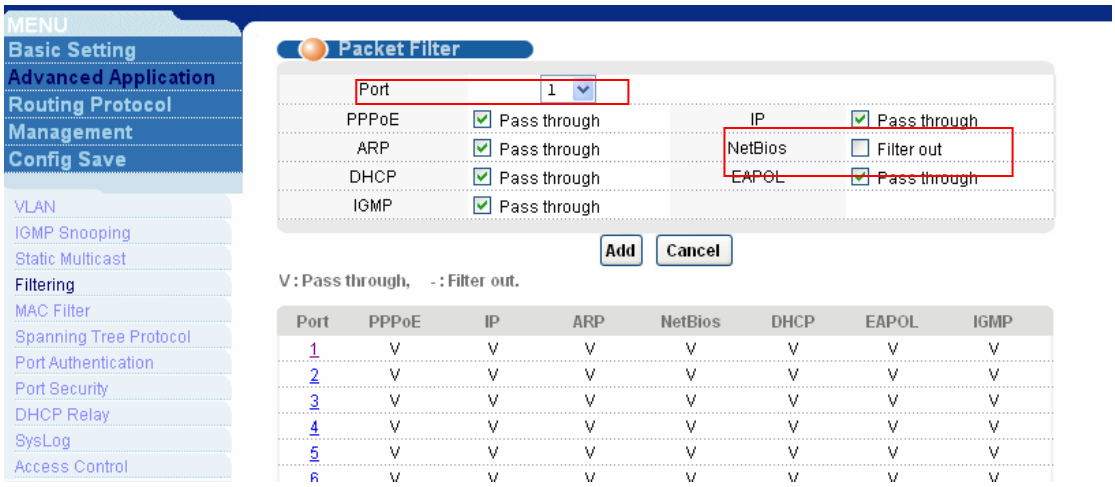
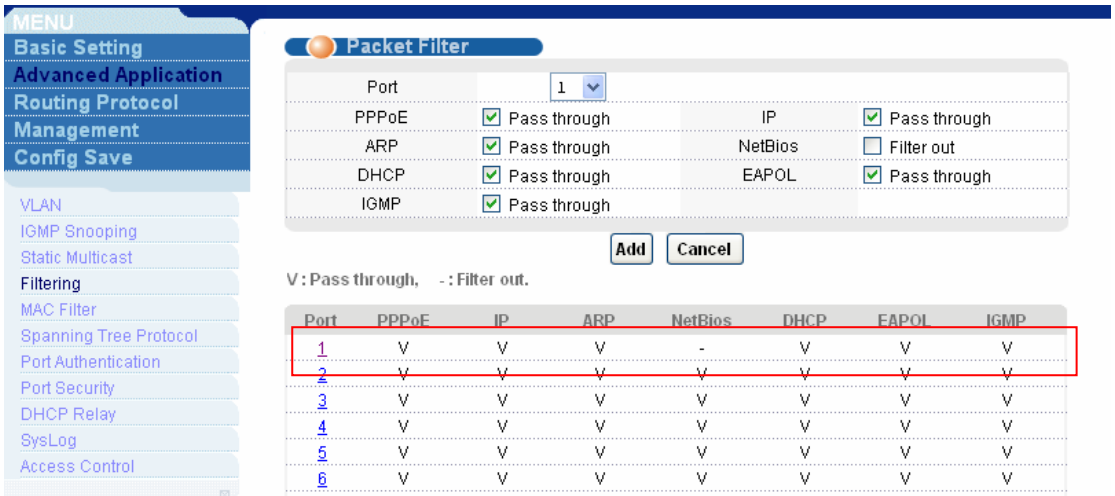


Please select port 1 and clear the **NetBios** check box. Meanwhile, you will see **Filter Out** in **NetBios** check box. Press **Add** button make the change take effect.



So you will see the port 1 will block the NetBios protocol packets.



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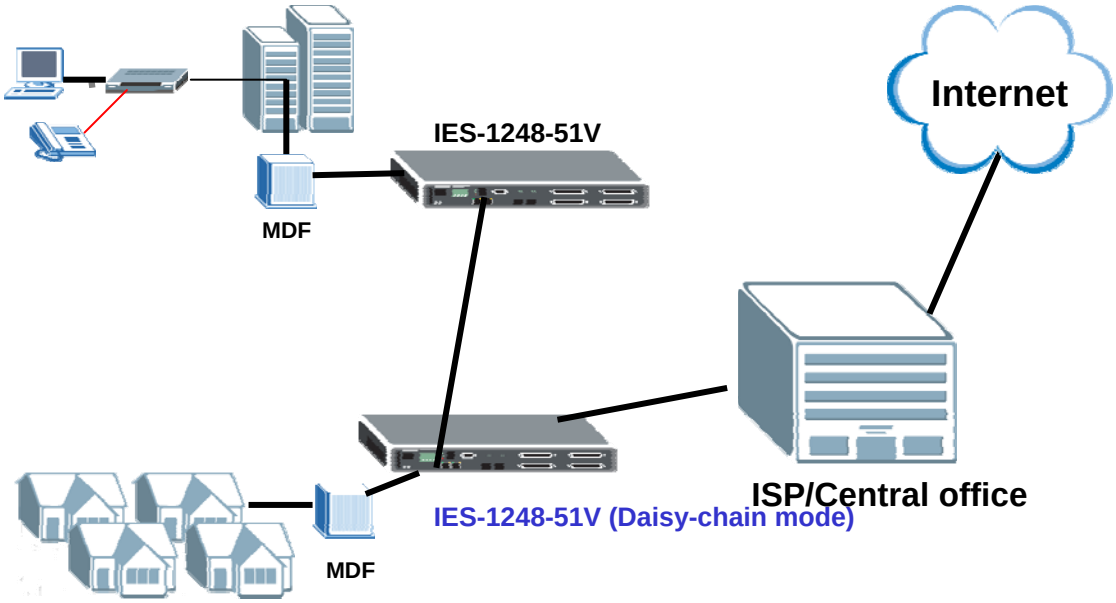
Cascade two IES-1248-51V (Daisy chain mode)

You know, the IES-1248-51V is a remote mini-DSLAM. When the subscriber number is increased, ISPs may cascade or daisy-chain the more then one IES-1248-51V to extend the port number. They can daisy-chain up to three IES-1248-51V.

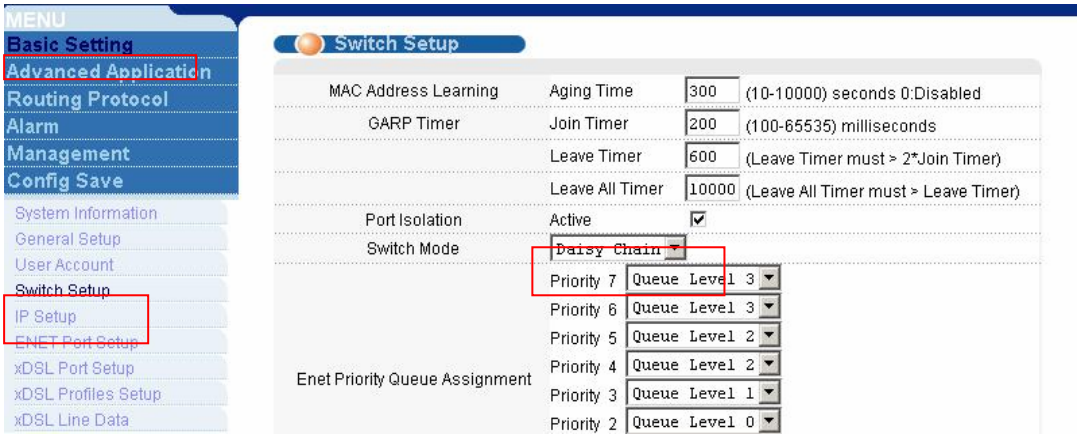


How to setup Daisy-chain mode

In this case, we daisy-chain two IES-1248-51V. Please see the figure above. We only set the one connected to the ISP as Daisy-Chain mode. In Daisy-Chain mode, connect the Ethernet Port 1 to the Ethernet backbone and connect the Ethernet Port 2 to another IES-1248-51V. Note that we don't suggest using loop network topology while using daisy-chain mode.

1. IES-1248-51V settings

Click **Basic Setting**, **Switch setup** in the navigation panel to display configuration screen as shown. You will see the **Switch setup** page. In **Switch Mode** combobox, select the **Daisy chain**. Don't forget press **Apply** button to let the setting take effect.



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FAQ

What is the IES-1248-51V?

The IES-1248-51V is an IP-based DSLAM that connects ADSL and voice subscribers to the Internet. It provides 48 aggregated lines of POTS connectivity, designed to connect the subscriber with the PSTN. Each telephone line interface is a FXS port connecting to the subscriber's telephone via copper wire. The analog voice signal from the subscriber is converted to voice data packets and transmitted towards the callee across the IP packet-switched network. The IES-1248-51V uses SIP for network signaling to establish or tear down a voice call. DTMF signals are also translated into SIP signals (or transmitted in the voice band).

What is the maximum line rate of IES-1248-51V?

It can support ADSL2+, so line rate can reach to 1.2Mbps in upstream direction and 25 Mbps in downstream in a short distance.

How many sessions are allowed to access IES-1248-51V at the same time?

- Console Port: 1
- Telnet: 5
- FTP: 1
- WEB: No limit
- SNMP: No limit

What is the power requirements of IES- 1248-51V?

- Voltage: DC power input (-36V DC ~ -72V DC)
- Power consumption: max. 170 Watts

What kind of the ADSL standards does IES-1248-51V comply?

- G.992.1 Annex A, G.992.3 Annex A, Annex L, Annex M
- G.992.5 Annex A, Annex M , G.994.1 G.hs
- Support G.992.3, G.992.5, G.997.1 Spectral Mask and Physical Layer

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Parameter Management

- Support EOC and Overhead Channel Access
- Support the latency path function
- Support Impulse Nose Protection
- Support loop diagnostic management function
- DELT (dual end loop test)
- SELT (Single end loop test)
- Support the power management capability
- Support Seamless Rate Adaptation (SRA)

What kind of the Multicasting functionalities does IES-1248-51V support?

- IPv4 multicasting
- GVRP
- IGMP v1 & v 2 snooping/proxy
- Multicast VLAN
- Support 512 multicast groups
- Support 50 members in a multicast group
- Static multicast forwarding
- IGMP group count limiting per DSL port
- IGMP filtering profile

What kind of the Media Gateway Signaling protocols are supported?

- ITU-T H.248 version 2
- SIP protocol (RFC 3261) which supports TCP & UDP transport as well as includes SIP extension
- RFC 3262 Reliability of Provisional Response in SIP.
- RFC 3265 SIP-Specific Event Notification
- SDP (RFC 2327)

What kind of the Media Gateway Communication protocols are supported?

- IP/UDP/RTP encapsulation for IPV4
- RTP (RFC 1889), RTCP (RFC 1890)
- Session Timer Protocol (RFC 4028)

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- Bi-directional DTMF tone detection and generation
  - bypass
  - RFC 2833,
  - RFC 2833 like
  - SIP INFO
- FAX/Modem pass through (T.38 or G.711) via RTP

What are the limitations for each ADSL port of IES-1248-51V?

Number of Mac filter: 10
Number of PVC: 8
Number of PPVC: 2
Number of PPVC member: 8
Number of RPVC: 8
Number of TLSPVC: 8
Number of PAEPVC: 8
Number of Vlan: 16
IGMP maximum group per DSL port is 16
IGMP maximum host IPs per DSL port is 16
IGMP maximum host IPs per Ethernet port is 1024
Number of DHCP snooping: 32
Maximum joined MVLAN: 4
Maximum ACL profile mapping: 8

What are the system limitations of IES-1248-51V?

Number of VLAN: 1024
ADSL profile: 96
ATM profile: 96
IGMP filter profile: 128
ADSL ALARM profile: 8
Dot1X profile: 64
DHCP relay server: 32
IP ROUTE: 128
Static multicast address: 32
Igmp groups: 512 groups
MAC learning: 14k at most (128 per ADSL port at most, 4k per ENET port at most)
RPVC gateway IP address: 96

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RPVC routing entry: 96
ACL profile: 128
IP bridging:
- Domain: 8
- VLAN per Domain: 8
- Edge router: 64 (VLAN per Domain * max of Domain)
- Interface: 384 (DSL port number * max of Domain)
- Routes per Domain: 16
- Routes: 128
- ARP per ENET port: 64
- ARP per DSL port: 32

PPPoE Intermediate Agent: 48
VLAN Isolation: 16
Static IP entry pool for DHCP snoop: 3
User Account: 16
Mvlan number: 16 (4 per ADSL port at most)

What are the VoIP limitations of IES-1248-51V?

Number of SIP profiles:	128
Number of SIP Call Service profiles:	128
Number of DSP profiles:	128
Number of numbering plan table:	32
Per table limitations:	
Number of entries per numbering plan table:	16

What kind of the voice CODECs does the IES-1248-51V support?

IES-1248-51V supports G.711a/u, G.726, G.729 a/b and G.723.1.

What is the ADSL chipset of IES-1248-51V?

Broadcom

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How many VLAN ID and Static VLAN entry does IES-1248-51V support?

- Supported VLAN ID : 1024
- Each DSL port only allows joining up to 16 static VLAN entries.

What does it mean if the ALM LED lights on?

The ALM LED lights when the IES-1248-51V is overheated, the fans are not working properly, the voltage readings are outside the tolerance levels or an alarm has been detected on the ALARM input pins.

What is the default console rate of IES-1248-51V?

9600, 8bit data, no parity, stop bit=1, no flow control.

How to upgrade the firmware of IES-1248-51V?

IES-1248-51V supports using FTP and WEB GUI to upgrade the firmware. It also supports upgrading the firmware by HyperTerminal software via local console cable.

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Appendix A – Installation of SER

SER (SIP Express Router) is an open-source SIP proxy, redirect and registrar server from Iptel.org, an offshoot of the German national research company FhG Fokus. In addition to voice call signaling, SER includes support for SMS, presence, SIP-based instant messaging and a jabber gateway among other applications. The design is intended to represent a genuine translation of circuit-switched dial plan configuration into Internet-centric mechanisms rather than the transliteration often seen. This architectural choice lends SER significant flexibility. The following section is intended to help the reader through basic installation and administration only. Further documentation and mailing list information are available at http://www.iptel.org/ser.

RPM Package Installation

[root@VOIP root]# rpm -ivh ser-0.8.12-0.i386.rpm
[root@VOIP ser]#./configure
[root@VOIP ser]#make
[root@VOIP ser]#make install
[root@VOIP root]#rpm -ivvh ser-mysql-0.8.12-0.i386.rpm
(install ser and mysql package)
[root@VOIP root]# /usr/bin/mysql_install_db

```
Preparing db table
Preparing host table
Preparing user table
Preparing func table
Preparing tables_priv table
Preparing columns_priv table
Installing all prepared tables
070128  0:44:26  /usr/libexec/mysqld: Shutdown Complete

To start mysqld at boot time you have to copy support-files/mysql.server
to the right place for your system

PLEASE REMEMBER TO SET A PASSWORD FOR THE MySQL root USER !
This is done with:
/usr/bin/mysqladmin -u root  password 'new-password'
/usr/bin/mysqladmin -u root -h voipRH9B  password 'new-password'
See the manual for more instructions.

You can start the MySQL daemon with:
cd /usr ; /usr/bin/safe_mysqld &

You can test the MySQL daemon with the benchmarks in the 'sql-bench'
directory:
cd sql-bench ; run-all-tests
```


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Please report any problems with the /usr/bin/mysqlbug script!

The latest information about MySQL is available on the web at
http://www.mysql.com
Support MySQL by buying support/licenses at https://order.mysql.com

To start the daemon of SER:

[root@VOIP root]# /etc/init.d/ser start

or

[root@VOIP root]# /etc/rc.d/init.d/ser start

Real-time monitor

[root@VOIP root]# /usr/sbin/serctl moni

or

[root@VOIP root]# /usr/local/sbin/ser –P /var/run/ser.pid

Following is the result:

[cycle #: 10; if constant make sure server lives and fifo is on]
Server: Sip EXpress router (0.8.12 (i386/linux))
Now: Mon Sep 20 16:37:32 2004
Up Since: Tue Sep 14 19:21:40 2004
Up time: 508552 [sec]

Transaction Statistics
Current: 0 (0 waiting) Total: 0 (0 local)
Replied localy: 0
Completion status 6xx: 0, 5xx: 0, 4xx: 0, 3xx: 0,2xx: 0

Stateless Server Statistics
200: 36 202: 0 2xx: 0
300: 0 301: 0 302: 0 3xx: 0
400: 0 401: 0 403: 0 404: 0 407: 0 408: 0 483: 0 4xx: 0
500: 0 5xx: 0
6xx: 0
xxx: 0
failures: 0

UsrLoc Stats
Domain Registered Expired
'location' 0 4

To stop ser server

[root@VOIP root]# /usr/sbin/serctl stop

or

[root@VOIP root]# /etc/rc.d/init.d/ser stop

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mySQL Setup

[root@VOIP root]#/usr/local/bin/mysql_install_db
(Initiate MySQL database)
[root@VOIP root]#/etc/rc.d/init.d/mysqld start
(Start MySQL server)
[root@VOIP root]#/usr/sbin/ser_mysql.sh create
run this script to create SER database in mysql
MySql password for root: BLANK (press “Enter”)
Domain (Realm) is the domain name for the SIP users: foo.bar
Second password: BLANK (press ”Enter”)

Add an account for SER:
[root@voipRH9B ser]# export SIP_DOMAIN="foo.bar"
[root@voipRH9B ser]# /usr/sbin/serctl add 200 1234 john@foo.bar
MySql password: (← default is heslo)
new user added

[root@voipRH9B mysql]# /usr/sbin/serctl monitor

You need to set environment variable SIP_DOMAIN (e.g. to 'foobar.com') first

[root@voipRH9B mysql]# export SIP_DOMAIN="foo.bar"
[root@voipRH9B mysql]# /usr/sbin/serctl monitor

[cycle #: 240; if constant make sure server lives and fifo is on]
Server: Sip EXpress router (0.8.12 (i386/linux))
Now: Sun Jan 28 01:06:16 2007
Up Since: Sun Jan 28 00:52:03 2007
Up time: 853 [sec]

Transaction Statistics
Current: 0 (0 waiting) Total: 2 (0 local)
Replied localy: 4
Completion status 6xx: 0, 5xx: 0, 4xx: 2, 3xx: 0,2xx: 0

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